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Editorial

AI Technology and SMEs: Small-and Medium-sized Enterprises (SMEs) play a vital role in propelling a country's growth in many ways. In the Indian context, SMEs have been a source of entrepreneurship and innovation. In addition, SMEs play a crucial role in the Indian economy, accounting for 40% of all exports and 30% of the nation's GDP. These organizations offer enormous employment opportunities and promote regional development. However, in the current technology driven world, the advancement of these enterprises greatly depends on their ability to harness the potential of modern technologies. Deep learning techniques have led to a number of new uses for artificial intelligence (AI), which makes AI crucial for any business looking to stay competitive. AI is a key component of many Industry 4.0 (I4.0) technologies, including big data and the Internet of Things. Numerous multidisciplinary fields can be developed as a result of AI's ability to complement and collaborate with other technologies. The future of business significantly relies on AI as the world becomes more data driven.

AI has become an effective tool for India's SMEs, enabling them to make data driven decisions, revolutionize their operations, and stay competitive in the digital era. AI may benefit SMEs in a variety of ways, including as supply chain optimization, marketing and sales, fraud detection, customer relationship management, and many more. A number of stakeholders, including owners, employees, clients, and the general public, may benefit from the use of AI in SMEs.

The adoption of artificial intelligence technology is useful for the success of business. AI has many advantages, like simplifying business operations and giving predictive insights based on current trends. As a result, it improves operational efficiency while saving businesses money and time. In the past, AI technologies have been primarily implemented in multinational corporations. Because of their restricted scalability, many AI technologies like cloud computing and big data analytics are still adopted more slowly even though they are very relevant for SMEs. For instance, AI can be used in chatbot applications and image generation applications. Consequently, there are eight primary categories into which the AI adoption states of SMEs can be divided: knowledge, infrastructure, resources, compatibility, culture, competitiveness, ecosystem, and regulation. Thus, AI becomes essential for small and medium-sized Enterprises (SMEs) as well as tech companies.

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30th November 2024



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Use of AI Tools in Teaching of Commerce and Economics

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ABSTRACT

Artificial Intelligence (AI) enables the growth of collaborative learning and promote content creation and facilitation both by students and teachers. It brings out an innovative way to customise the process of teaching and learning. Not just content creation, AI nowadays, provides the platform to learn multiple languages as well as translate the database into any language one finds to be suitable. Despite many challenges, AI has proved to be one of the most sought-after technologies in many fields like science, education, medical etc. This paper is an attempt to find out the various generative AI tools used by different stakeholders in the teaching-learning process. It also attempts to analyse the prospects and challenges that would emerge with the further growth and innovation in the field of AI in education and learning, especially in the subject areas of commerce and economics. Using secondary data for analysis, it was found that ChatGPT, Duolingo, HelloTalk, Grammarly are some of the widely used AI tools used in education by students and teachers to enhance the quality of lecture delivery and content writing. Use of AI has multiple advantages as it reduces the burden of heavy work on human beings and transforms a lot of labour-intensive work into technical and machine oriented. However, to utilise the benefits of AI, one must be well equipped with the technology it comes along and also be cautious with the security issues that sometimes may create havoc with data draining and malpractices.

KEYWORDS: Artificial Intelligence, ChatGPT, Commerce, Economics, Teaching tools.

INTRODUCTION

With the increasing prominence of Artificial Intelligence (AI) in every spheres of life its presence is seen in almost every segment of our lives. In our daily lives AI's presence is through various modes like medicare systems and financial transactions. However, AI's roots trace back to ancient times. Philosophers like Aristotle have laid the groundwork for AI by focusing on Thoughts and Consciousness. In recent times John McCarthy used it one of his published works in the year 1956. Soon after a paper was published by Alan Turing on, "Computing Machinery and Intelligence" which explained the conception of work of a machine to replicate human beings and its expertise to handle intelligent things, like playing chess [1]. In 1956, a group of scientists convened a conference at Dartmouth College and set the foundation for research

in Artificial Intelligence. In the period of 1970s and 80s, researchers developed computer programs to mimic the decision-making abilities of a human brain. The period of the 1990s was for machine learning. Today's AI took its shape since 2010 with the dawn of deep learning.

The education sector has undergone tremendous changes in recent years. The teaching pedagogy has been shifted from a traditional to modern approach keeping in mind the changes in the society and environment at large. In recent times and specifically during COVID 19, the universities and colleges around the globe have transformed themselves into virtual classrooms. The pandemic paved the way for online learning and even after the pandemic has waned, online teaching still holds a pertinent position in the teaching-learning process. There has been a continuous growth of project based and experiential learning.

AI in the educational sphere is a very recent development. AI is amongst the emerging fields of Education and Teaching Learning Practice. The progress of AI technologies has significant use for teaching and learning. AI-supported instructions and methodologies is expected to add newness in education sector [2].

Experts expected the growth of AI usage in education to be 43% in the year 2018–2022 [3] whereas the current projections are 34% growth annually (World Economic Forum Report, 2024). AI has the potential to accelerate SDG 4 and address several hindrances in the educational arena by innovating teaching and learning practices. UNESCO has published a report on, “Artificial Intelligence and Education: Guidance for Policy-makers,” which highlights the prospects and challenges of AI in educational field. [4]

LITERATURE REVIEW

Muthukrishnan et.al(2020) in their paper “Brief history of Artificial Intelligence” studied about the traces of AI and that machine learning is a sub topic under AI. There is tremendous potential in the field of AI, however, due to huge unrealistic expectations there has been phases of AI winters. [5]

Bin, Yi et al. (2019) in their paper, ‘English Teaching Practice Based on Artificial Intelligence Technology’, presented the practice of AI in English language delivery in middle schools by stressing on core curriculum system, literature investigation and field study. They also suggested a AI based english assisted training system for College level application. [6]

Kadaruddin, K. (2023) in his article, “Empowering Education through Generative AI: Innovative Instructional Strategies for Tomorrow’s Learners” gave stress on the merits of using generative AI tool in education. As it can assist educators in creating interactive content, and aid in managing assessments and in turn enhance the learner engagement and knowledge retention. [7]

Kastania, N. (2023) in the paper, “Generative AI: Implications and Applications for Education” discussed about the implications of Chatbots in education. The paper examines the application of C-LLM to assess complex students work. [8]

Farrelly, T., & Baker, N. (2023) in Generative Artificial Intelligence: Implications and Considerations for Higher Education Practice, studied the contribution of ChatGPT in lesson plan making, decisive thinking and openness in education. The study reveals that ChatGPT can offer detailed information and support systems to schoolteachers. However, ChatGPT should be used with caution keeping in view their limitations and potential biases. [9]

Baidoo-anu, D., & Owusu Ansah, L. (2023) conducted an exploratory study of the published literature to emphasise on the potentials and drawbacks of ChatGPT and its usage in supporting education and the teaching-learning processes. The study puts forward suggestions on the usage and leverage of ChatGPT in teaching and learning modules. [10]

Zhen, Huixin & Yahaya, Wan. (2024) in their study stressed on the application of AI in flipped classroom. AI tools like ChatGPT can promote personalised training among students. For teachers, ChatGPT can help them to design better course materials and classroom activities. It also enables educators to provide timely feedback. [11]

Moorhouse, Benjamin & Yeo, Marie & Wan, Yuwei. (2023) in their paper studied the guidelines which are adopted by the top universities globally on the usage of GAI in assessments, teaching learning practices and curriculum development. The findings focussed on the requirement of instructors to understand the influence of using GAI and design suitable evaluation methods to get assistance in teaching pedagogy. [12]

OBJECTIVES

1. To study the various generative AI tools for education.
2. To study the prospects and challenges of AI in teaching pedagogy of Commerce and Economics.

METHODOLOGY

The study is based on secondary data gathered from multiple scholarly articles and journals for conducting the literature review, framing the objectives and finding the research gap. The keywords used in the study are AI, Education, Commerce, Economics. The database

from Google Scholar is referred to while reviewing the secondary data.

AI IN EDUCATION

Generative AI Tools for Education

There are several tools of AI that are used in the field of education. The tools can be broadly classified as: Learner facing AI tools, Teacher facing AI tools, System facing AI tools. [9]

1. **Learner Facing AI tools-** These softwares are widely common amongst students who use it to understand new information. It is also known as Intelligent Tutoring System. Examples of Learner facing AI tools are: Smart sparrow, Knewton, Duolingo, Hello Talk, Babble, ChatGpt
2. **Teacher facing AI tools:** These software enables teachers to implement innovative ways of classroom teaching, get insights of students and reduce their work load. Some of the Teacher Facing AI tools that are widely used are: Quillionz, Turnitin, Grammarly, and Copyscape, ClassCharts.
3. **System Facing AI tools:** This software is used by the administrators to make inform decisions about the education system as a whole.

Some of the Generative AI tools highly used in education are as discussed below:

1. **ChatGPT:** The work of Generative AI is to create new data base based on existing information. It can also create content on multiple areas such as script, imageries, music composition, etc. Generative AI models depend on neural networks and deep learning techniques to evaluate, identify, and create content closely resembling human-generated outputs. Out of the several available AI models, ChatGPT has emerged as a remarkable tool offering an array of application through several domains.
2. The main focus of ChatGPT is to enable machines to understand natural language and accordingly create content for humans. The main motive behind developing ChatGPT was to introduce a greatly sophisticated and versatile AI language model that will be helpful in performing various tasks

like content creation, language translation, data analysis, etc.

The architecture of GPT-3.5 forms the basis of Chat GPT. It is the updated model of the GPT-3 version launched by OpenAI in 2020. The most important feature in ChatGPT is its competence to recognize context and generate results based on human prompts. It can be converted to a broad range of fields. ChatGPT is automated to decode multiple languages and is enabled for global applications and satisfy varied user bases.

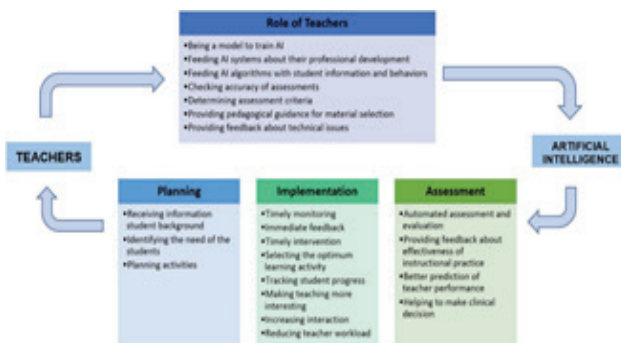
3. **Grammarly:** Grammarly is a AI assisted software specialised in correcting grammar errors in various forms of writings. It offers ideas for alterations and enhancements in real-time as users' type, making it a valuable tool for students working on essays, research papers, or any written assignments. Grammarly can be unified into various platforms like web browsers, Microsoft Word, Google Docs, and more, making it easily accessible for students across different devices and applications. Additionally, Grammarly provides insights into writing patterns, vocabulary usage, and overall writing clarity, helping students enhance their communication skills and become more effective writers.
4. **HelloTalk** is a mobile application designed for language learners to practice speaking and writing in foreign languages with native speakers around the world. The app offers various language learning tools, including translation, pronunciation guides, grammar explanations, and vocabulary lists. HelloTalk provides built-in tools for language correction. Users can highlight and correct each other's language mistakes, helping them learn from their errors and improve their language proficiency.
5. **Duolingo:** Duolingo is a prevalent platform that provides courses in math, music and others in multiple languages. By utilising the techniques of gamification, it makes learning fun and engaging. Users can learn at their own pace, earning points and leveling up as they progress through lessons. The platform covers as many as 43 languages, from majorly spoken ones like Spanish and French to less commonly taught languages like Swahili and Esperanto. Duolingo offers both free and premium

versions, with the free version supported by ads and the premium version offering additional features such as offline access and ad-free learning.

Prospects and Challenges of AI in teaching pedagogy of Commerce and Economics.

PROSPECTS

AI and innovative technologies have been incorporated by many advanced educational organisations and major corporations to shift the physical burden in humans to automated delivery of work in the future. Inclusion of AI into multiple technologies like chatbots (Clark 2020), automated grading systems and intelligent tutoring (Heffernan & Heffernan, 2014) have put forward multiple prospects to stakeholders during the entire teaching-learning process. (Chen et. Al. 2020).



CHALLENGES

One of the most important consideration for deployment of AI in classroom is ethical and responsible use of AI in delivering content. Successfully integrating generative AI in the teaching-learning process demands for a core preparation of educators to use these technologies effectively. Training and professional faculty development programs are essential to equip the faculties with the required expertise and learning to adopt the prospects of generative AI for pedagogical workings.

To implement AI in education sector the AI developers must possess requisite knowledge and expertise which is scantily available. As the idea related to pedagogical insights and learning sciences for effective implementation is scarce (Luckin & Cukurova, 2019) [13]. Also, AI creators at times, unknowingly ignore the prospects of all the stakeholders who will use

AI in education (Cukurova & Luckin, 2018, Luckin & Cukurova, 2019) [14] [13]. The foremost users of the technology are the educators and their needs and demands should be given due weightage while developing any AI based teaching or educative tool (Seufert et al., 2020). [15]

To adopt AI based educative tools teachers must be adequately trained to sharpen their AI knowledge, its usage and implementation ability, so that they may impart it to students in a lucid way (Hakkinen et al., 2017; Kirschner, 2015; Seufert et al., 2020). [15]. However, the set of requisite skills which teachers' need to have is yet to be specifically defined, thus there remains a virgin area for exploring the same. A detailed understanding of the requisite training for teachers, skills required, attitudinal and behavioural training and their engagement with AI tools needs an detailed investigation (Seufert et al., 2020) [15]

Artificial Intelligence (AI) is reshaping the educational landscape, especially in fields like Commerce and Economics. With the initiation of generative AI tools such as ChatGPT, Grammarly, and Duolingo, AI is offering innovative opportunities for both educators and learners. These tools enhance personalized learning, reduce teacher workloads, and promote interactive and immersive learning experiences. AI-supported instruction can offer intelligent tutoring, automated grading, and assistance in creating lesson plans, fostering a more engaging and efficient learning environment.

However, there are also significant challenges in fully integrating AI into education. One main worry area is the ethical and responsible use of AI, especially in teaching content and assessment. Additionally, the lack of pedagogical insights among AI developers and the insufficient preparedness of educators pose hurdles. For AI to be successfully adopted in the teaching of Commerce and Economics, teachers need comprehensive training and development to utilise the advantages of AI technologies effectively.

Future of AI in the field of education holds great promise, but it requires thoughtful integration, training for educators, and addressing ethical considerations to fully realize its benefits in the teaching-learning process.

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ABSTRACT

The present research looks into how employee motivation affects productivity in the automobile industry in Kanchipuram. Motivation has a big impact on employee behavior, productivity, and a company's overall effectiveness. This study uses a combination of quantitative and qualitative research approaches to examine the relationship between several motivational elements, such as financial incentives, opportunities for career progression, recognition, and work environment, and employee performance. A broad sample of workers from various departments and levels of many Kanchipuram-based automakers provided the data. According to the results, employee performance and motivation are significantly positively correlated, with intrinsic motivators like job satisfaction and personal development having a particularly large impact. The study concludes with recommendations for management practices that can enhance employee motivation and, consequently, performance, thereby contributing to the overall success and competitiveness of the automobile industry in Kanchipuram.

KEYWORDS: *Motivation, Employee performance, Automobile industry, Recognition, Work environment, Intrinsic motivators.*

INTRODUCTION

Employee performance is a pivotal factor in determining the success and competitiveness of any organization. In industries characterized by rapid technological advancements and high demand for efficiency, such as the automobile industry, the importance of optimizing employee performance cannot be overstated. Among the various factors that influence performance, motivation stands out as a critical element that drives employees to achieve their full potential and contribute effectively to organizational goals.

A variety of internal and external elements combine to generate motivation, which inspires workers to carry out their duties with zeal and commitment. Long-term commitment and engagement are greatly aided by intrinsic motivators including job pleasure, personal development, and a sense of achievement. Financial incentives, chances for professional progression,

and recognition are examples of extrinsic motivators that offer instantaneous, material rewards that can temporarily improve performance. Developing successful management strategies requires an understanding of how these motivating elements interact with employee performance. This is especially important in the automotive sector, where there is constant demand to innovate and uphold high standards of productivity and quality. By exploring the specific motivational drivers within this sector, organizations can tailor their approaches to better meet the needs of their workforce and achieve superior performance outcomes.

In this study, the relationship between employee motivation and performance is examined, with a focus on the Kanchipuram automobile sector. This study aims to identify the manner in which various motivating factors influence performance in order to assist businesses in this area in raising employee productivity

and overall effectiveness. Using a combination of quantitative and qualitative research methods, this study seeks to determine the key elements impacting employee performance in the automotive sector and how motivates them.

Kanchipuram, known for its rich cultural heritage, has also emerged as a significant hub for the automobile industry in India. The presence of numerous automobile manufacturing plants and ancillary units has transformed the region into an industrial powerhouse. This setting provides a unique opportunity to study the motivational factors that drive employee performance in a highly competitive and technologically advanced industry.

A varied workforce of skilled workers, engineers, managers, and administrative personnel is a defining feature of Kanchipuram's automotive industry. Each of these groups may respond differently to various motivational strategies, highlighting the need for a comprehensive approach to understanding and enhancing motivation. By addressing these differences, organizations can develop tailored strategies that effectively boost performance across all levels of the workforce. Moreover, the dynamic nature of the automobile industry, with its constant technological innovations and market fluctuations, necessitates a flexible and adaptive approach to employee motivation. Understanding how motivational factors impact performance in this ever-changing environment can provide valuable insights for both academic research and practical applications. In order to help industry executives create a motivated and productive workforce, this study attempts to close the gap between theory and practice by providing evidence-based advice.

REVIEW OF LITERATURE

Employee motivation is a crucial element that improves an association's capacity to operate as an organization, per research done in 2019 by Ankur Jain, Bhuwan Gupta, and Meenakshi Bindal [1]. In light of current globalization, human resources must be the primary emphasis of any firm. In the modern world, success is guaranteed for any organization that treats its people as its most valuable resource. Motivation and inspiration will enable expert aim achievement.

Datuk Dr. Mahamad Zubir bin Seeht Saad [2] states

that the purpose of this survey is to identify the most effective motivational techniques for companies. Motivated and happy workers tend to create more. By giving employees difficult assignments and offering guidance and assistance, management can help staff members develop into highly qualified experts in their respective fields.

In the pursuit of enhanced employee efficiency and productivity, organizations continually seek innovative strategies. While various approaches have been employed to foster employee motivation, achieving sustained commitment toward work-related goals remains challenging. A prevailing debate centers around motivation, with some asserting its intrinsic nature, thereby rendering it resistant to external influences. Conversely, others posit that many methods exist to enhance employee motivation, contingent upon discerning individual preferences. A fundamental approach frequently adopted by employers is the provision of monetary incentives, recognized for their potential to elevate motivation, efficacy, and productivity [3], [4].

Alamsyah, A., Hamboer, M. E., & Pranawukir [5] emphasize the critical importance for every organization to leverage skilled human resources in their respective fields. They argue that government agencies, in particular, should undertake activities that enhance employee performance and contribute significantly to organizational goals. Human resource development plays a pivotal role in maximizing the potential of personnel within an institution, ensuring they operate efficiently towards fulfilling the organization's vision and mission.

An organization's most productive asset is a motivated employee, according to Kalaivani, K., & Venkatachalam [6]. When a person is driven, they can motivate and support their colleagues, which improves job performance and advances the company. In order to increase engagement and strengthen the bond between employers and employees, firms must place a high priority on employee motivation.

Arthur, B., Mnasi, H. M., & Omari, H. [7] highlight that employee motivation is a crucial factor affecting organizational performance, whether in service-based or related sectors. The effectiveness of workforce

performance is pivotal for organizations, as employees are directly responsible for executing business strategies. Their study reveals a significant correlation between job design techniques and employee motivation, which directly impacts the performance of service companies. Therefore, they advocate for the development of job designs that enhance employee performance, emphasizing improvements in workplace environment and overall office design to foster a safe and healthy work environment conducive to optimal performance.

STATEMENT OF THE PROBLEM

Employee motivation is a critical determinant of organizational success, particularly in industries where human capital plays a pivotal role, such as service sectors. While extensive research has established the importance of motivation in enhancing employee performance, there remains a need for focused investigation into how specific motivational strategies, including job design techniques and improvements in workplace environment, influence employee engagement and productivity in service-oriented organizations.

The challenge lies in identifying and understanding the nuanced relationships between job design, workplace environment, employee motivation, and overall organizational performance within service sectors. Existing literature provides fragmented insights into these aspects but lacks a cohesive framework that integrates these factors comprehensively. Furthermore, the dynamic nature of service industries, characterized by rapid technological advancements and evolving customer expectations, underscores the urgency for tailored motivational strategies that align with organizational goals and foster sustained employee commitment. Moreover, while studies have highlighted the impact of motivation on individual employee outcomes, there is a gap in research focusing on how enhanced motivation can translate into collective organizational effectiveness and competitive advantage in service sectors. A more thorough investigation of the ways in which driven staff members support customer happiness, service quality, and overall organizational resilience in the face of competitive challenges is required to close this gap.

In order to fill these gaps, this study looks into how job design strategies, workplace enhancements, and

employee motivation all work together to promote organizational performance in service industries. By identifying effective motivational practices and their outcomes, this research aims to provide practical recommendations for service organizations to enhance workforce engagement, optimize operational efficiency, and achieve sustainable growth in a competitive market landscape.

OBJECTIVES OF THE STUDY

1. To evaluate the connection between employee performance and several motivating elements, including monetary rewards, chances for professional advancement, and recognition, in the Kanchipuram automotive sector.
2. To identify effective strategies for enhancing employee motivation within the automobile sector in Kanchipuram, aiming to improve overall employee performance and organizational competitiveness.

RESEARCH METHODOLOGY

For this study, a Tree Structured Analysis methodology will be employed to systematically explore and categorize the various factors influencing employee motivation and their subsequent impact on performance within the automobile industry in Kancheepuram. This approach involves organizing motivational factors into a hierarchical structure resembling a tree, where primary branches represent broad categories such as financial incentives, career development opportunities, recognition, job satisfaction, and work environment.

The primary methods of data collection will be both qualitative and quantitative. Employees from various departments and levels of several car firms in Kancheepuram will be given structured surveys to complete in order to collect quantitative data. These surveys will gather information about how important and effective certain motivating factors are thought to be. On the other hand, in-depth interviews with managers, staff members, and human resources representatives will be used to gather qualitative data. The subtleties of employee perceptions, experiences, and the contextual elements affecting motivation and performance will all be covered in greater detail in these interviews.

Stratified random sampling will be used as part of the sampling strategy to guarantee representation from

a variety of workforce sectors in Kancheepuram's automotive industry. In order to get a complete picture of employee experiences and viewpoints, this method will take into account variables including work roles (such as production, sales, and administration), hierarchical levels, and firm sizes.

Within the framework of a tree, the gathered data will be organized into primary and secondary branches using hierarchical analysis. While secondary branches will describe particular elements and sub-factors affecting motivation and performance, primary branches will include broad categories of motivational factors. The statistical analysis of quantitative data will be done using methods like correlation analysis to look at the connections between performance results and motivational factors. Thematic analysis will be used to find recurrent themes, patterns, and narratives from the qualitative data about employee motivation and how it affects performance.

The entire research procedure will be conducted with ethical considerations as its top priority. Participants' informed consent, confidentiality, and anonymity will all be protected throughout the data gathering and reporting process. To safeguard research participants' rights and welfare, the study will abide by institutional review board (IRB) regulations and ethical standards.

Through rigorous analysis approaches, survey instrument validation, and triangulation of data sources, the validity and reliability of the findings will be improved. The results will undergo a comprehensive evaluation to guarantee precision and dependability in deriving conclusions regarding the correlations between employee performance and motivational elements in the Kancheepuram automobile sector.

Reporting of findings will involve clear and structured presentation, utilizing visual aids such as tree diagrams to illustrate the hierarchical analysis of motivational factors. The implications of findings will be discussed in terms of practical recommendations for organizational policies, practices, and future research directions aimed at optimizing employee motivation and enhancing overall performance in the automobile industry context.

TREE STRUCTURED ANALYSIS FOR IMPACT OF EMPLOYEE MOTIVATION ON PERFORMANCE OF THE EMPLOYEES IN AUTOMOBILE INDUSTRY IN KANCHEEPURAM

In the dynamic and competitive environment of the automobile industry in Kancheepuram, the performance of employees plays a crucial role in organizational success. Employee motivation stands out as a significant factor influencing how effectively employees contribute to the achievement of organizational goals. In addition to exhibiting increased levels of engagement and productivity, motivated workers also favorably impact workplace culture and overall business results.

This study employs a Tree Structured Analysis to explore the impact of employee motivation on the performance of employees within the automobile industry in Kancheepuram. By structuring the analysis hierarchically, this research aims to systematically evaluate various motivational factors that influence employee performance. These factors may include financial incentives, career development opportunities, recognition, job satisfaction, and work environment, among others, which collectively contribute to enhancing employee motivation.

Designing efficient management techniques suited to the unique requirements of the Kancheepuram automotive industry requires an understanding of the complex interplay between employee motivation and performance.

This study seeks to uncover the underlying mechanisms through which motivation affects employee performance, offering insights that can inform organizational practices and policies aimed at fostering a motivated workforce. Through a comprehensive analysis of data gathered from employees and managers in various automobile companies in Kancheepuram, this research aims to provide empirical evidence supporting the importance of motivation in driving employee performance. It is anticipated that the study's conclusions will provide insightful information about how to improve employee motivation tactics in the automotive sector, which will ultimately boost organizational effectiveness and competitiveness in the market.

Table. 1 Model summary of employee motivation

Specifications	Growing Method	CHAID
	Dependent Variable	Overall Performance of the employees
	Independent Variables	Performance appraisal system is a motivation, Motivation are objectively determined, Rewards and Awards are motivating technique, Employees are involved, Decisions made on accessibility, Innovative salary package, Team work is a significant factor, Organization relies on horizontal control and coordination, Providing competitive edge, Making of an impact, Individuals take effort to improve
	Validation	None
	Maximum Tree Depth	3
	Minimum Cases in Parent Node	100
	Minimum Cases in Child Node	50
Results	Independent Variables Included	Individuals take effort to improve, Team work is a significant factor
	Number of Nodes	6
	Number of Terminal Nodes	4
	Depth	2

Source: Output generated from SPSS 20

Fig. 1. Tree Diagram for the employee motivation

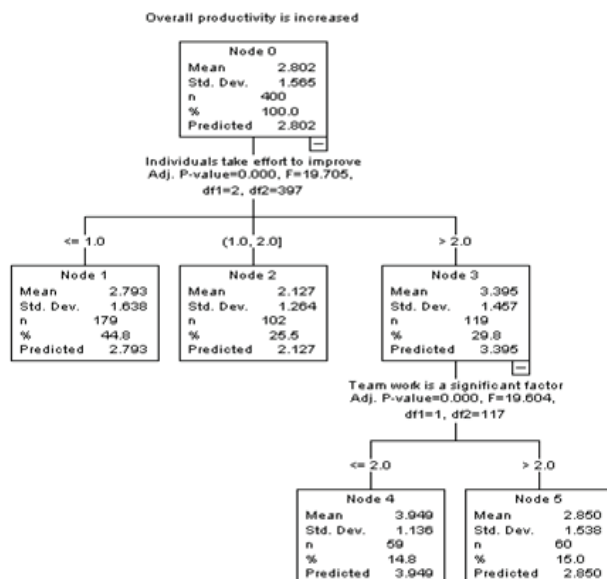


Table 2 Risk of the model for employee motivation

Estimate	Std. Error
2.133	.098
Growing Method: CHAID Dependent Variable: Overall performance of the employees	

Source: Output generated from SPSS 20

The standard error linked to the expected effect size is indicated by the risk estimate given in the context of a CHAID (Chi-squared Automatic Interaction Detection) model for employee motivation. The model's estimated risk of 2.133, accompanied with a standard error of 0.098, indicates the degree of uncertainty or unpredictability surrounding the association between employee motivation components and overall performance. When referring to the dependent variable (employee performance), the risk estimate (2.133) in statistics indicates the expected effect size or impact of the independent variables (e.g., motivation-related factors). A smaller standard error suggests more confidence in the correctness of the risk assessment. The standard error of 0.098 denotes the precision of this estimate. The risk estimate, which stands at 2.133, represents the expected level of influence that employee motivation elements will have on overall performance. In this instance, the model's computations yield an estimated 2.133 units of rise in total employee performance, which is correlated with an increase in motivation-related parameters, according to a risk estimate of 2.133.

Standard Error (0.098): This small standard error indicates that the model's estimate of 2.133 is likely to be close to the true effect size, given the precision of the data and the model's statistical reliability.

Understanding the risk estimate and its associated standard error helps stakeholders and researchers gauge the reliability and significance of the model's predictions. It highlights the potential impact of enhancing employee motivation on improving overall performance within the context studied, while also acknowledging the inherent variability and uncertainty that can affect these estimates in real-world applications. Therefore, while the risk estimate provides valuable insights into the relationship between motivation and performance, cautious interpretation and consideration of the standard error are essential for making informed

decisions and drawing reliable conclusions from the CHAID model analysis.

Table 3. Gain summary for nodes for employee motivation

Node	N	Percent	Mean
4	59	14.8%	3.95
5	60	15.0%	2.85
1	179	44.8%	2.79
2	102	25.5%	2.13
Growing Method: CHAID Dependent Variable: Overall Performance of the employees			

Source: Output generated from SPSS 20

In order to investigate the complex associations between different independent factors and the dependent variable—the overall performance of employees in the organization—the CHAID (Chi-squared Automatic Interaction Detection) analysis was carried out in this study. The analysis methodically partitioned data based on categorical independent variables such as the effectiveness of performance appraisal systems, the objective determination of motivation, the use of rewards and awards as motivational tools, employee involvement in decision-making processes, accessibility of decisions, innovative salary packages, the importance of teamwork, horizontal control and coordination within the organization, the competitive edge provided, the impact made, and individual efforts to improve themselves. The analysis identified key variables that significantly influenced employee performance, namely individuals' efforts to improve and the significance of teamwork within the organization. The decision tree constructed through CHAID revealed critical insights into how these factors interacted to predict employee performance, with a maximum tree depth of three levels and a requirement of at least 100 cases in parent nodes and 50 cases in child nodes for further splitting. These findings underscore the importance of targeted motivational strategies and collaborative efforts in enhancing overall employee performance within the organizational context studied.

The gain summary for nodes in the CHAID analysis provides a clear picture of how different segments of employees, characterized by various motivational factors, contribute to overall performance. It highlights opportunities for organizations to tailor motivational

strategies based on the specific needs and characteristics of different employee groups, ultimately aiming to optimize overall performance in the context of the dependent variable, which is the overall performance of employees in this study.

RESULTS AND DISCUSSION

The tree analysis model summary underscores the significance of “Individuals take effort to improve” and “Teamwork is a significant factor” as pivotal independent variables influencing employee motivation within the automobile industry in Kancheepuram district. These findings are derived from empirical values obtained through CHAID (Chi-squared Automatic Interaction Detection) analysis, indicating their critical role in shaping employee perceptions and behaviors towards motivation.

In the context of the automobile industry in Kancheepuram district, the study reveals that employees place substantial importance on personal initiative for growth and development, alongside the collaborative dynamics inherent in teamwork. These factors are identified as the most influential drivers of employee motivation, suggesting that initiatives promoting individual skill enhancement and fostering cohesive team environments are essential for enhancing workplace satisfaction and performance.

Moreover, the analysis highlights the perceived significance of attributes related to teamwork and the appraisal of performance in motivating employees within this specific industry context. A supportive work environment where employees feel empowered and inspired to make valuable contributions to the success of the company is greatly facilitated by these components.

Therefore, these empirical findings not only validate the importance of intrinsic motivational factors within the automobile industry in Kancheepuram district but also emphasize the need for tailored strategies that prioritize individual development and promote collaborative work practices. Organizations may effectively boost employee motivation by utilizing these insights, which will result in a resilient and productive workforce that can propel sustainable growth and competitiveness in the ever-changing automotive industry.

CONCLUSION

A number of important insights that can guide organizational practices and initiatives are highlighted by the Kancheepuram district's study on employee motivation in the automotive industry. By using CHAID analysis, two important independent variables—"Individuals take effort to improve" and "Teamwork is a significant factor"—have been identified as being crucial to raising employee motivation.

These findings highlight the importance of fostering a work environment where employees are encouraged to proactively enhance their skills and collaborate effectively within teams. Such initiatives not only promote intrinsic motivation but also contribute to overall organizational performance and employee satisfaction. The study also emphasizes the relevance of performance appraisal systems and teamwork in shaping employee perceptions towards motivation. By recognizing and rewarding individual efforts while fostering a culture of teamwork, organizations in the automobile industry can create a conducive atmosphere where employees feel valued and motivated to excel.

Moving forward, organizations should consider integrating these findings into their strategic HR practices. This involves designing and implementing tailored motivational programs that align with the specific needs and dynamics of the automobile industry in Kancheepuram district. By investing in employee development initiatives and promoting collaborative work environments, organizations can effectively nurture a motivated workforce capable of driving innovation, productivity, and sustainable growth in the competitive automotive market.

In the end, the empirical data emphasizes how important employee motivation is to the success of a firm. In Kancheepuram's thriving automotive sector, companies may cultivate a culture of excellence that not only draws in top talent but also maintains and optimizes the

potential of current staff by giving priority to projects that improve individual and team-based motivations.

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Consumer Buying Behavior and Perception of FMCG Aavin Dairy Products: A Study with Special Reference to Chennai

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ABSTRACT

By providing milk to the entire population, milk agribusiness has consistently has been the foundation of the system of Indian economy. Since dairy production produces milk in accordance with demand, it has a direct impact on poverty alleviation. Regardless of whether it is favourable or bad, the adoption of the agricultural part will have a multiplier wave that will affect the entire economy. Additionally, associated industries like dairy, agribusiness, and animal development are actively working to improve the overall financial situation of average India. Viable and balanced progress in growing and cooperative segments is required to maintain the ecological evening out. Coordinators have promised to bring the division together for the financial improvement of the national division since our initial preparation. The development of dairy products is presented as a small invention that creates lucrative job opportunities.

The best dairy substantial discovery in India. Given the significant difficulty, all associations, regardless of size, must periodically assess the temperament, inclinations, and movement tendencies of their clientele. The relative quality item at a lower cost noticeable quantity, according to the buyer's perspective. This study focuses on Chennai, Tamil Nadu, and consumers' perceptions of Aavin products. The quick rise in new milk product names is a reflection of India's milk industry's extraordinary growth. Milk brands may boost sales and ensure complete customer happiness with the aid of consumer perception. The belief that consumers hold when they search for, utilize, evaluate, and reject Consumer perception refers to meet the consumers believe their need of goods and services. A standardized questionnaire was employed to gather the study's main data from Chennai's Aavin clients. The study's conclusions make it abundantly evident that a number of variables, including product attributes, cost, quality, variety, and services, are related to consumer impression. Suggestions are made to increase client happiness

KEYWORDS: *Aavin, Dairy products, Customer satisfaction, Perception.*

INTRODUCTION

Dairy products play a crucial role in the Indian economy, particularly due to their contribution to nutrition and poverty alleviation through agricultural activities. The dairy sector, encompassing both large- and small-scale enterprises, serves as a foundation for economic growth and job creation, offering significant employment opportunities [1](Zhong, Chen, & Kong, 2013). The Department of Dairy Development in Tamil Nadu, established in 1958, and the formation of the Tamil

Nadu Co-operative Milk Producers' Federation Limited (Aavin) in 1981, signify the state's commitment to enhancing the dairy industry [2](Rangasamy & Dhaka, 2008). Aavin has been integral in meeting the increasing demand for dairy products, driven by consumer needs for quality and affordability.

Consumer perception plays an essential role in purchasing decisions, influencing both the retention of existing customers and the attraction of new ones [3] (Susanty et al., 2017). Understanding this perception

helps organizations to tailor their strategies to meet consumer expectations, thus boosting customer satisfaction and loyalty [4](Ahila & Boopathib, 2015). As consumers' choices are influenced by various factors such as price, taste, and packaging, examining these elements can provide valuable insights into how dairy brands like Aavin can enhance their market presence [5] (Elangovan & Gomatheeswaran, 2015).

The empirical model examining business performance, loyalty, and trust within the dairy milk supply chain highlights key challenges, particularly due to the lack of effective identification processes between milk cooperatives and dairy farmers. This gap can lead to conflicts of interest and exacerbate managerial issues, particularly in the Chennai dairy sector. The conduct of dairy farmers and cooperatives in trading interactions underscores the necessity for cooperative leaders to implement transparent and accountable strategies regarding milk pricing and operations, even if not mandated. Such strategies are essential to maintain trust and foster cooperative stability.

Executives of dairy cooperatives do not need to constantly consider farmers while making display-based decisions, particularly when it comes to costs, products, advertising, and progress. In light of the dairy industry's long-term flexibility, it is advised that dairy cooperatives include the milk estimation by that time in order to expand their market reach and boost public returns.

Now a day's customers play a great role in decision making. And more than the needs & wants of the customer it is an emotions and feelings of the consumer towards a specified brand or products influence more while making a purchasing decision. Therefore, the most crucial aspects on which a business should concentrate in demand to maintain its current clientele and draw in new ones is customer impression. In the end, it is an inevitable component that determines a company's profitability. The phrase "customer perception" in marketing refers to the attitude, feeling, emotions, impression, awareness, etc. that a customer has of a brand or product. Customer perception, to put it simply, is what current and potential customers believe about the business and its offerings.

Given the competitive nature of the dairy industry, it is imperative for brands like Aavin to regularly assess consumer feedback and adapt their practices accordingly to remain relevant (Karthikeyan, R. 2019). This study focuses on analyzing consumer perception and satisfaction with Aavin products in Chennai, highlighting key factors such as quality, price, and availability that influence consumer behavior. The objective is to provide insights into strategies that can be adopted by Aavin to optimize their operations and foster customer loyalty in a highly competitive market.

OBJECTIVES OF THE STUDY

1. To assess customer perception of Aavin products.
2. To evaluate customer satisfaction with Aavin dairy products.
3. To explore purchase perceptions of Aavin products.
4. To examine the loyalty, brand image, and credibility of Aavin products.

HISTORY OF THE STUDY

The Department of Dairy Development in Tamil Nadu was established in 1958 to oversee and support the state's dairy sector. On August 1, 1965, this department assumed full administrative and legal authority over all milk cooperatives within the state, further strengthening its role in regulating and managing dairy activities. The establishment of the Administrator for Milk Production and Dairy Development was formalized under the Tamil Nadu Cooperative Societies Act, which aimed to streamline the operations of cooperative societies and enhance dairy production and management.

In line with the 'Anand Plan' model, the Tamil Nadu Co-operative Milk Producers' Federation Limited, popularly known as "Aavin," was founded on February 1, 1981. This federation was tasked with a comprehensive set of responsibilities, including the procurement, processing, chilling, packaging, and distribution of milk and dairy products to consumers. Over time, the federation evolved to manage the operational needs of the dairy sector and ensure the delivery of quality dairy products. The involvement of private dairies in recent years has also brought competitive dynamics to the industry, underscoring the need for strategic improvements and streamlined processes within the cooperative

model. The Hon'ble Chief Minister of Tamil Nadu has emphasized the importance of adopting structured methods and robust systems to bolster the efficiency of milk cooperatives.

The cooperative societies, unions, and the overarching federation in Tamil Nadu have collectively achieved significant milestones in dairy production. Tamil Nadu stands as one of the leading milk-producing states in India, with a daily output exceeding 14.5 million gallons. The Tamil Nadu Cooperative Milk Producers' Federation Limited, through its brand Aavin, has played a critical role in this success. Annually, Aavin processes and markets approximately 5,994 liters of milk and procures an average of 33 liters per day from its producers. Moreover, Aavin has expanded its reach by exporting milk to several countries, contributing to the global footprint of Tamil Nadu's dairy industry.

IMPORTANCE OF THE STUDY

This study holds significant importance as it delves into the operational, economic, and social aspects of the dairy supply chain within Tamil Nadu, with a particular focus on Aavin, the state's cooperative dairy federation. Understanding the dynamics between milk cooperatives and dairy farmers is crucial in enhancing the efficiency, transparency, and trust within this system. The findings of this research will provide insights into areas that require structural and policy reforms to ensure sustainable growth and fair practices in the dairy sector.

1. By analyzing the current challenges faced in the supply chain and trade relations, the study can offer recommendations to boost the business performance of dairy cooperatives. Enhancing efficiency in operations such as procurement, processing, and distribution can lead to cost savings and increased productivity. This is vital for maintaining competitiveness in a sector that is now seeing participation from private dairy players, driving the need for strategic improvements in cooperative operations.
2. Trust and loyalty are pivotal in sustaining long-term partnerships between dairy farmers and cooperatives. This study aims to identify the gaps in the current recognition procedures and interactions that may lead to issues of mistrust or conflict. By providing empirical data on the perceptions of

farmers and cooperative members, the research can help shape policies that strengthen mutual trust and commitment. Improved loyalty can lead to more consistent milk supply and cooperative growth, benefiting both farmers and consumers.

3. A significant portion of the study is dedicated to understanding consumer perceptions of Aavin's products. Consumer trust in dairy products impacts purchasing behavior, brand loyalty, and market expansion. Insights from this research can guide Aavin in improving product quality, branding strategies, and customer engagement, enhancing its competitive position in the dairy market.
4. The findings can be instrumental for policymakers and administrative bodies in designing better regulatory frameworks that support both dairy farmers and cooperatives. With the guidance of the Hon'ble Chief Minister of Tamil Nadu and cooperative leaders, the study's recommendations could lead to the development of comprehensive and well-governed strategies that align with industry best practices and local needs.
5. As one of India's leading milk-producing states, Tamil Nadu's dairy sector significantly contributes to the local economy and provides livelihood for thousands of farmers. Strengthening the dairy supply chain ensures stable incomes for farmers and stimulates rural development. This study seeks to explore how collaborative efforts and transparent practices can foster economic resilience and social cohesion in dairy farming communities.
6. The entry of private players into the dairy market has brought about a new wave of competition, necessitating a more sophisticated approach to cooperative management. This research can help identify adaptive strategies that enable cooperatives like Aavin to leverage modern technologies, adopt more efficient production methods, and stay relevant in an evolving marketplace.

SCOPE OF THE STUDY

The study goals to recognize the customer's awareness of Aavin products in Chennai city. This study is made with the limit of 200 customers in Chennai. The study gives further scope for further improvement on parameters for

the whole of Tamil Nadu state. It also helps the industry to know the level of satisfaction based on the customers taste, quality and other important factor.

REVIEW OF LITERATURE

[3]Aries Susanty et al. (2017), in their study titled, “The Empirical Model of the Dairy Milk Supply Chain’s Commercial Success, Loyalty, and Trust”, examined the challenges in Chennai’s dairy sector, noting the critical issue of unregulated practices between dairy cooperatives and farmers. Without a formalized agreement, both parties often prioritize their interests, which can destabilize operations. The authors recommended that cooperative CEOs implement transparent strategies focused on accountability, particularly for pricing and marketing, and adopt an inclusive approach that considers farmers’ perspectives. This, they suggested, would promote long-term industry sustainability and profitability by expanding market reach.

[6]Karthikeyan, R. (2019), in Consumer Satisfaction with Aavin Milk Products, found that consumers favor Aavin products due to their affordability, quality, appropriate packaging, and precise product weight. The study emphasized the importance of providing training and education for milk producers and sellers to further enhance product standards and customer satisfaction.

[7]Arun and Dhanya (2020) highlighted that Aavin is well-regarded by consumers and has significant potential to increase its market share, particularly in rural areas. In today’s competitive landscape, consumers are drawn to products that offer good taste and innovative packaging. To strengthen its market position, Aavin could consider reducing prices and offering smaller package sizes, such as 100ml and 200ml, to attract lower-income consumers. Additionally, strategic sales promotions could support greater market penetration.

[8]Manida and Nedumaran (2020) emphasized the promising role of milk and dairy products in the food processing sector, particularly through traditional dairy items and milk-based desserts. The authors noted that product quality and safety are essential for brand success, which can be effectively communicated through strong advertising. They pointed out that consumer spending on milk and dairy products is growing in both urban and rural areas, a trend expected to continue. Implementing

these insights, the Tamil Nadu Cooperative Milk Producers’ Federation Limited (Aavin) can enhance product quality, broaden its brand offerings, and better meet consumer expectations.

METHODOLOGY OF THE STUDY

Characteristic the study findings are analyzed to using the research approach. Data and other relevant information are gathered using the survey approach, which uses a structured questionnaire. Practicality For numerical convenience, 200 samples—that is, customers of Chennai-based Aavin Dairy products—are employed in the sampling process.

ANALYSIS AND INTERPRETATION

Table 1: Regular Usage

Regularity of Customers	Response	Percentage
Yes	116	58%
No	84	44%
Total	200	100%

Source: Primary Data

The data presented in Table 1 indicates the regularity of customer usage for Aavin products. Out of a total of 200 respondents, 116 individuals (58%) reported that they regularly use Aavin products, while 84 respondents (42%) indicated that they do not use these products regularly. This implies that a majority of the surveyed participants have a consistent habit of using Aavin products, reflecting a significant level of customer retention and loyalty. However, the fact that 42% of respondents do not regularly use the products suggests room for growth in market penetration and opportunities for the company to engage in targeted marketing efforts to convert occasional or non-users into regular customers.

Table 2: Opinion about price of Aavin products

Price – Dairy Products	Response	Percentage
Very high	16	8%
High	82	41%
Reasonable	96	48%
Low	6	3%
Total	200	100%

(Source: Primary Data)

Table 2 presents the respondents' opinions regarding the pricing of Aavin dairy products. Among the 200 surveyed participants, 96 individuals (48%) believe that the prices of Aavin products are reasonable. This represents the majority view, indicating that nearly half of the consumers perceive the pricing as fair and acceptable. On the other hand, 82 respondents (41%) feel that the prices are high, suggesting that a significant portion of the customer base finds the products somewhat costly. A smaller segment, 16 respondents (8%), view the prices as very high, pointing to potential pricing concerns that may affect affordability and accessibility. Only 6 respondents (3%) consider the prices to be low, indicating that minimal perception exists of Aavin products being budget-friendly.

Table 3: Rating on quality of Aavin products Quality

Rating on Quality	Response	Percentage
4	24	12%
3	120	60%
2	56	28%
1	0	00/0
TOTAL	200	100%

(Source: Primary Data)

Table 3 provides insights into customer ratings regarding the quality of Aavin products. A significant majority, 60% of respondents, rated the quality as 3 (good), indicating a generally favorable perception of Aavin's product quality. 12% rated it a 4 (excellent), reflecting a smaller but still notable group who view the products as superior. Conversely, 28% gave a rating of 2 (fair), suggesting that a considerable portion of customers feel the quality could be improved. Interestingly, no respondents rated the products a 1 (poor), which indicates that even the more critical consumers do not perceive the quality as poor. Overall, while the majority are satisfied with the quality, there is room for improvement, especially in appealing to the 28% who consider the quality only fair. Enhancing the product quality further could potentially increase overall customer satisfaction and loyalty.

Table 4: Awareness towards customized Aavin products

Awareness on customized Products.	Response	Percentage
Yes	152	76%
No	48	24%
TOTAL	200	100%

(Source: Primary Data)

Table 4 reveals that a large majority of respondents, 76%, are aware of Aavin's customized products, indicating that the company has been successful in promoting and informing its customers about its specialized offerings. In contrast, 24% of respondents are unaware of these customized products, which suggests that there is still an opportunity for Aavin to enhance awareness among this segment. Overall, the high level of awareness reflects positively on Aavin's marketing efforts, but the company could further increase customer engagement by addressing the needs of the remaining quarter of respondents who are not yet familiar with the customized products.

Table 5: Satisfaction towards various factors related to Aavin products.

Rating	Variety	Marketing Efforts	Availability
Highly satisfied	24 (12%)	32(16%)	36(18%)
Satisfied	120 (60%)	100(50%)	120(60%)
Neutral	48 (24%)	48(24%)	36(18%)
Dissatisfied	8 (4%)	20(10%)	8(4%)
Highly dissatisfied	0 (0%)	0 (0%)	0 (0%)
TOTAL	200(100%)	200(100%)	200(100%)

(Source: Primary Data)

Table 5 indicates that a majority of respondents are satisfied with Aavin products across various factors. Specifically, 60% are satisfied with the variety of products, 50% with marketing efforts, and 60% with availability. While a smaller percentage, around 12% to 16%, are highly satisfied with these factors, there is still a segment (4%-10%) who are dissatisfied or neutral. This suggests that Aavin's overall performance is positive, but there remains room for improvement in enhancing satisfaction, particularly in marketing efforts and product variety.

Table 6: Customer's recommendation to others for purchasing Aavin products

Recommendation	Response	Percentage
Yes	170	85%
No	30	15%
Total	200	100%

(Source: Primary Data)

Table 6 reveals that a significant majority of respondents, 85%, would recommend Aavin products to others, indicating a high level of customer satisfaction and trust in the brand. Only 15% of respondents would not recommend the products, suggesting that while the overall sentiment is positive, there is still a small group of consumers who may have reservations. This strong recommendation rate highlights Aavin's potential for customer loyalty and positive word-of-mouth, which can be valuable for expanding its market presence.

Table 7: Factors influenced to choose Aavin

Factors	Response	Percentage
Price	8	4%
Quality	116	58%
Taste	44	22%
Availability	28	14%
Packaging	4	2%
Other factors	0	0%
TOTAL	200(100%)	200(100%)

(Source: Primary Data)

Table 7 shows that the most significant factor influencing customers' choice of Aavin products is quality, with 58% of respondents selecting it as the primary reason. Taste follows with 22%, indicating that flavor is also an important consideration for a substantial portion of consumers. Availability is a factor for 14% of respondents, while price, packaging, and other factors have minimal influence, with only 4%, 2%, and 0% of respondents citing them, respectively. This suggests that Aavin's strong brand reputation for quality plays a dominant role in attracting customers, while taste and availability are secondary but still relevant factors.

CONCLUSION

Consumer perception is a crucial factor for a company to maintain profitability, as it influences both customer acquisition and retention. The study reveals that when purchasing dairy products, customers primarily consider factors such as quality, taste, texture, freshness, and convenience. However, the key challenge lies in making milk affordable while maintaining these essential qualities. According to the survey, Aavin meets

customer expectations as a market leader, with 48% of respondents rating its product prices as reasonable, while 41% feel the prices are high. To attract and retain more customers, Aavin may consider reducing its prices, especially since a significant portion of consumers perceive them as excessive. As competition increases, Aavin could also refine its marketing strategies to attract new customers and keep existing ones informed about new product offerings.

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The Psychology of Rewards & Recognition in Driving Employee Performance: A Case Study of Coir Industry in Southern Region of Kerala

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ABSTRACT

The impact of rewards and recognition on the employees' performance and productivity has been signified in the research. The case study of the coir industry in Kerala has been used in this study to evaluate the importance of rewards and recognition strategies offered by the companies to enhance the productivity of the organisations prioritising profitability. Employee retention and low wages are the major factors in the coir industry that increase employee dissatisfaction. Therefore, the study highlighted the rewards and recognition approach's significance in mitigating the challenges associated with job satisfaction. In this research, the researcher selected a secondary data collection procedure to collect data based on existing information from peer-reviewed journals.

KEYWORDS: Rewards, Recognition, Coir industry, Employees, Motivation.

INTRODUCTION

The derived extract from the coconut husk is called coarse fibre and is mainly used for making ropes, mats and mattresses. Based on this material, the coir industry has been developed in Kerala, considering its geographical circumstances. The word Kerala is associated with coconut as in the Malayalam language, the Kera word represents coconut, and Alam indicates the land. It means Kerala is considered the land of coconut. Therefore, Kerala has the largest clustering and coir manufacturing units, depending on the resources. Alappuzha, Kannur, Kollam and Thiruvananthapuram are the prior districts of Kerala where the Coir industry has created an exclusive position in the business market (Bordoloi & Bordoloi, 2020). [1] However, the unavailability of raw materials creates difficulties for the sector as fibre is one of the essential materials for coir products, and Kerala is going through a deficient situation for fibre availability. Social and ecological circumstances create adverse impacts on

fibre production, and the coir industry in Kerala highly depends on Tamilnadu for the accessibility of fibre.

MATERIALS AND METHODS

The methodological interpretation can help to justify the research. Therefore, the researcher has focused on selecting appropriate methodological tools to collect evidential data to meet the research goal. Considering the consistency of the investigation, interpretivism research philosophy has been selected by the researcher in this study. Interpretivism philosophy helps to assume multiple subjective perspectives based on phenomena of the social world (ASWATHY, 2018) [2] Following the interpretivism philosophy, the researcher selected the inductive research approach to draw a general conclusion considering the specific observation. A case study research design has been prioritised in this study, as the coir industry of Kerala has been focused on this study. The employee perspectives of the coir industry in Kerala have been identified in this research by following the case study design. The most effective

and significant methodological approach to research is the data collection and data analysis procedure.

In this research, the researcher has conducted a secondary data collection procedure depending on the peer-reviewed journals and articles. On the basis of secondary collected data, the researcher has approved thematic data analysis to create the significance of the research in a justified manner. The cost-effective and time-saving approach of the secondary data collection procedure and thematic data analysis procedure has a practical approach to reaching the study goals with evidential justification (Özkan, Azizi & Haass, 2021). [3] The impact of rewards and recognition on employees' performance has been analysed and evaluated through the thematic data analysis considering the secondary collected data. The researcher's flexible and independent expressive approach helps to explore employees' perspectives in improving workplace performance.

RESULTS

Importance of rewards and recognition of employees in an industry

Employees are the primary pillar of the organisational structure. The productivity and performance of employees drive the organisational success along with brand reputation and expansion of the business. Therefore, employee satisfaction is one of the major concerns of organisations, and material rewards and psychological rewards play an essential role in enhancing workforce satisfaction (Kumari et al., 2021). [4] On the other hand, an organisation's rewarding approach increases employees' trust and loyalty, which also reflects on workforce performance. Organisations also get benefits from this rewarding approach. It helps to boost teamwork and emphasises the productivity of the companies. Rewards are significant HR practices that ensure the reduction of employee turnover along with helping in exploring talents and creativity in teams that enhance the probability of innovation, considering leveraging competitive advantages (Kryscynski, Coff & Campbell, 2021). [5] A healthy organisational culture has also been developed with employees' positive contributions.

Considering the beneficial perspectives of the rewarding approach, the coir industry in Kerala can use this

strategy to retain employees' number. According to the case study, approximately 18% of employees in the coir industry in Kerala are aged over 70 years. Therefore, the young employees must be retained in the business platform due to their physical power and quick activities. However, the financial condition and low wage circumstances create job dissatisfaction among young employees, who tend to switch jobs. Material rewards such as monetary allowance or financial offers can help increase the employees' interest in engaging in business platforms with better performance. The rewarding approach can be an effective instrument to motivate employees to engage with the coir industry and increase the productivity and performance of the business, including the workforce (Tandon et al. 2021). [6] In fact, the coir industry is already offering rewards and financial benefits to its employees to enhance employee satisfaction. Psychological rewards that include mental support and further future commitment also play a vital role in improving workforce performance.

Apart from this, recognition is another weapon that helps to increase the trust and loyalty of the workers towards the organisation. Appreciation, depending on the performance of the workforce, is a significant approach of an organisation that helps to motivate employees to remain in the business with practical productivity and performance (Kalogiannidis, 2021). [7] The coir industry in Kerala mostly follows this appreciation strategy that encourages the employees to sustain this traditional business. Getting recognition for working performance provides the feeling of pride and prioritisation among the employees, which also benefits the organisations with more effective productivity. On the other hand, recognition also emphasises the workforce's trust and loyalty and indicates the employees' better performance and productivity.

Impact of motivation on employees' performance indicator in the context of the coir industry in Kerala

The motivational approach is one of the most effective strategies for engaging employees. An organisation's motivational initiative influences the productivity and performance of the workforce. Increased productivity and job satisfaction of the employees can be considered the performance indicator of the workforce, and motivational initiatives act as an acceleration tool to

improve the employees' performance and productivity. The coir industry in Kerala is following the way of approaching intensives, rewards and bonus that helps to motivate employees to engage in the business.

The feeling of prioritisation in employees is reflected in their increased productivity and performance, and the further circumstances enhance the demand for the products and the business's profitability. Employees' motivation also emphasises creativity and innovation (Fischer, Malycha & Schafmann, 2019). [8] The coir products depend on the creativity and design approach. Therefore, cultivating talents and experience is a significant objective of the industry. Therefore, promoting job satisfaction for the labourers is a prior concern of the industry. Further business expansion also, to some extent, depends on the employees' performance and productivity.

Leveraging the opportunity to expose the coir industry on an international platform also helps to enhance the labourer wages, which creates more employee inspiration for better performance and productivity. Retaining the workforce in the business is the primary purpose of organisations for motivating them. The high retention rate of the employees in the companies also signifies performance indicators of the workforce. The motivational approach determines the trust and loyalty of the company towards the labourers (Hsieh, Lee & Tseng, 2022). [9] According to the case study of the coir industry, it has been observed that most of the labourers are aged and middle-aged, indicating the high retention rate of the employees in the coir industry. Enhanced job satisfaction also has been highlighted by the total number of workers in the coir industry. The sub-sequences endorse the effectiveness of successful motivating activities of the coir industry in Kerala

Challenges faced by the coir industry in Kerala that hampers the performance of employees

The coir industry is considered the traditional representative of coir products that play an important role in the local community of Kerala. According to the statistics, it has been observed that most of the local people of Kerala depend on the coir industry for their livelihood. However, the industry has faced many obstacles to survive in the business industry while maintaining the traditional impact of the coir products.

The most relevant issue of the coir industry is inadequate infrastructure, including sloth growth of the business and late development of the business progression that affect the business's profitability. A low profitability rate negatively impacts the workforce's wages, increasing employee dissatisfaction regarding their jobs.

On the other hand, the employees' low productivity also affects the coir industry's business performance. The rural communities under the poverty margin are primarily engaged in the coir industry and face the lack of power supply, water, transportation and other difficulties that create challenges in maintaining the business's existence (Banuprakash, 2019). [10] Considering the consequences, the coir industry is also facing the issue of the unavailability of labourers. The non-supportive approach of the government to hold the traditional method of the coir industry is also a concerning matter for the coir industry. In addition, labourers' health issues hamper the coir products' manufacturing flow, which can be considered a negative impact on the demand for the products.

International exposure is one of the significant challenges for the coir industry. Due to the non-supportive approach of the government and lack of proper financial dimensions, the coir industry fails to achieve the exposure objective in significant aspects. In addition, insufficient capability to pay the debt is a major financial concern of the coir industry. Derivation of the wage rates among the employees also accelerates the challenges for the coir industry. The lack of interest of the labourers affects the workforce's performance and negatively impacts the quality of the products (Samma et al. 2020). [11] In addition, according to the statistics, women workers are mainly involved in coir production, and most of them belong to the poverty line. Therefore, low wages are a major issue for them to retain in the business.

Antecedents and consequences of employee engagement in the coir industry in Kerala considering the physiological attachment, including job satisfaction, material rewards and job performance

The psychological attachment of the workers is a determinant factor that drives the employees' job satisfaction. A preferable work environment considering safety and security is an effective factor

that impacts employees' psychology. On the other hand, recognition in the workplace provides a proud feeling to the workforce and adds psychological satisfaction to employees.

Considering the material rewards, the trust and loyalty of the workforce have been increased towards the companies with positive psychological impacts. Mutual understanding between the higher authority and the workforce is also a courageous tool that helps to develop employees' performance, including the organisations (Maltseva, 2020). [12] Establishing a strong bond with the labourers in a communicative approach can provide psychological rewards to the employees. In Kerala's coir industry, the authority properly recognises the employees and appreciates their talents and experiences.

DISCUSSION

The final findings of the research have briefly signified the concept of rewards and recognition of employees considering their performance and productivity and its impacts on business orientation. The case study of the coir industry in Kerala has been focused on in this research, and the social introduction of the coir workforce has been interpreted in this study.

CONCLUSION

The research has focused on evaluating rewards and recognition's impact on employees. The case study of the coir industry in Kerala has been focused on in this research to highlight the real-world consequences considering the rewards and recognition. The researcher has selected the methodological tools of this study, which refer to the use of interpretivism research philosophy, case-study design and inductive approach to collect secondary data following the thematic data analysis technique.

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Deciphering Marketing Strategy Efficacy in the Laundry Care Products Sector: A Neural Network Approach

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ABSTRACT

The general influence and variance of marketing strategies in the laundry care products business are examined in this study using neural network analysis. The study uses a feed-forward multilayer perception model that uses the backpropagation approach to analyze a range of covariate variables and ascertain their effect on marketing efficacy. The results demonstrate the vital importance of experience, monthly cosmetics income, and product coverage in influencing marketing outcomes. Moreover, elements related to sales promotion, brand transformation, and revenue growth show noteworthy importance, highlighting essential elements of marketing success. By having a solid grasp of these factors, businesses may enhance industry competitiveness, adapt to shifting market conditions, and maximize their strategy. By offering useful data on the intricate dynamics of marketing strategies in the laundry care products industry, this study assists companies in achieving long-term success and growth.

KEYWORDS: *Marketing strategies, laundry care products, Marketing effectiveness, profitability, brand switching, market dynamics*

INTRODUCTION

Businesses are fighting for both market share and client loyalty in the fiercely competitive laundry care product sector of the constantly changing consumer goods industry. A key factor in this battle is the efficacy of marketing strategies, which serve as the foundation for consumer engagement, brand recognition, and ultimately financial success. Uncovering the secrets of marketing strategy efficacy in this sector requires innovative ways to navigate the complexity of consumer behavior and market dynamics. With its roots in artificial intelligence, neural network analysis is a potent computational technique that draws inspiration from how the human brain works. It is one such technique that is gaining traction. Researchers and organizations can uncover useful insights and patterns by delving deeper into the massive amounts of data created by customer interactions, industry trends, and competitive landscapes by utilizing neural network capabilities. This study uses neural network analysis to

shed light on the efficacy of marketing tactics used in the laundry care goods industry. With the use of this cutting-edge approach, we hope to reveal the intricate connections, subtle patterns, and ominous tendencies that underlie prosperous marketing campaigns in this industry. By investigating a wide range of factors, including market dynamics, product characteristics, and customer demographics, we aim to provide industry stakeholders with useful insights into the complexities of marketing plan effectiveness. The process of applying a neural network approach to analyze the effectiveness of marketing strategies in the laundry care products industry holds the potential to reveal new insights and transformational views. Through illuminating the factors that influence marketing efficacy and fluctuations in this industry, this study seeks to equip brands with the intelligence and insight required to improve their marketing strategies, augment customer involvement, and propel enduring expansion in a constantly changing marketplace.

REVIEW OF LITERATURE

In 2016, Josephine Mylan discussed how P&G implemented novel approaches to gather insights into consumer behavior within household settings. This involved conducting small-scale “real-world” experiments to collect information. Additionally, P&G devised a fresh model to comprehend consumer laundry behavior. In contrast to conventional behavioral models that classified people according to demographic or attitudinal characteristics, P&G’s strategy concentrated on comprehending how consumer attitudes differed depending on various laundry aspects like soiling, materials, colors, and apparel usage.

Procter & Gamble (P&G), Unilever, and Henkel are the three main multinational businesses that dominate the detergent manufacturing market, which is a highly competitive global industry. According to Wiesmann [1], these industrial titans sell their detergents under popular brand names including Ariel, Tide, Omo, Surf, and Persil. Each of these businesses makes significant investments in research projects because they understand how important customer behavior and purchasing trends are, particularly when it comes to sustainability. For example, P&G, as demonstrated by studies by Stalmans et al. [3] and Unilever, as noted by Shove [2], are actively involved in researching customer usage patterns and purchasing behavior, with an emphasis on sustainability-related elements.

With a thorough analysis of the tactics used by laundry detergent producers and merchants, this study explores the complexities of the factors influencing the adoption of lower temperature washing techniques. A comprehensive explanation of this phenomenon is provided by examining both technological and behavioral components. Using a coevolutionary paradigm that has developed over time through the writings of Foxon [5] and Murmann [4], this study examines the different elements that affect how successful voluntary business activities are at encouraging lower temperature washing. This creative method was selected since it can analyze the tactics of both individual companies and groupings of companies while taking customer behavior into account. As highlighted by Lewin et al. [6], it recognizes the interdependence of managerial choices, institutional effects, and technology and social interactions.

The commercial strategies employed by manufacturers and retailers of laundry detergent are carefully examined in this study, which also explores the nuances of the causes that contributed to the adoption of lower temperature washing techniques. It investigates the ways in which behavioral and technical advancements impact this trend. Based on the studies of Murmann [7] and Foxon [5], this study uses a coevolutionary framework that has evolved over time to analyze the relative effectiveness of different voluntary business activities. This method allows for a comprehensive evaluation of the factors influencing the efficacy of these initiatives by acknowledging the interdependence of business strategies and customer behavior. The coevolutionary approach acknowledges the connection of managerial actions, technological and social interactions, and institutional consequences, which enhances our understanding of the dynamics at play. Additionally, by integrating stakeholder theory, resource-based view of the firm, and institutional theory, this study builds on Mylan’s [8] case study on P&G’s efforts to change customer behavior for lower temperature laundry.

In recent years, companies have attempted to influence home practices in order to encourage sustainable consumption, although it is rare for them to actively influence how consumers use their products. It is noteworthy that UK supermarkets have been instrumental in efforts to reduce food waste in households [9]. In a same vein, branded apparel firms, such as shops and denim labels, have started to promote the reuse of garments [10]. With the goal of more deeply interacting with people’s daily lives, this article aims to expand our knowledge about business sustainable consumption activities. This is accomplished by looking into the case of “low-temperature laundry,” a project that aimed to change the way people do their laundry at home.

STATEMENT OF PROBLEM

Intense competition and changing consumer tastes in the laundry care products sector make it difficult for producers to successfully execute marketing plans. Despite the availability of various marketing approaches, determining the optimal strategy and understanding its impact and variability on laundry care products manufacturers remain significant challenges. Traditional methods of analyzing marketing strategies

may not capture the complex interplay of variables influencing their effectiveness. Therefore, the problem addressed in this analysis is the need to decipher the overall impact and variability of marketing strategies on laundry care products manufacturers using a comprehensive approach. Traditional analytical methods may not adequately capture the intricate relationships between various marketing factors and their effects on manufacturers. Consequently, there is a gap in understanding how different marketing strategies influence the overall performance and variability of laundry care product manufacturers in the market.

In order to fill this knowledge vacuum, this study uses a Neural Network (NN) approach to examine the complex effects and diversity of marketing tactics on producers of laundry care products. This study attempts to shed light on the key elements influencing the efficacy of marketing strategies in the laundry care products industry by utilizing NN's capabilities, which are excellent at managing complicated datasets and spotting nuanced patterns. Manufacturers can improve their methods and strengthen their position as market leaders by better understanding the main factors that influence marketing strategy success and variability.

RESEARCH QUESTIONS

1. How do marketing tactics affect producers of laundry care products overall?
2. What impact does the diversity of marketing tactics have on producers of laundry care products?
3. What are the main factors affecting how well marketing plans work in the market for laundry care products?
4. Which marketing elements are most crucial in influencing how well makers of laundry care products perform?
5. In comparison to more conventional analytical techniques, how successful is the Neural Network (NN) method in examining the influence and variability of marketing strategies on producers of laundry care products?

RESEARCH OBJECTIVES

1. To evaluate marketing techniques' total effect on laundry care product makers.

2. To examine how different marketing approaches differ and how it affects companies that make laundry care goods.

RESEARCH METHODOLOGY

The overall effect and variety of marketing methods on manufacturers of laundry care products are examined in this study using a Neural Network (NN) approach. The Back Propagation Algorithm is implemented in the study using a Feed Forward Multilayer Perception Model. The dataset comprises seven input layers, each of which represents a different collection of characteristics, including gender, education, monthly income, experience, and product type. Ten layers of covariates are also taken into account, which include factors like growth in sales, profit, customer base, and promotional activities. It incorporates a two-unit hidden layer using the hyperbolic tangent activation function. The output layer assesses the general effect of marketing tactics on producers of laundry care products. Training and testing the neural network model are part of the study, and performance metrics like relative error and sum of squares error are used to assess the model's performance. To determine their contributions to the model's predictions, the significance and normalized significance of independent variables are evaluated. The study's technique combines computational analysis and experimental validation to shed light on the efficacy and diversity of marketing tactics used in the laundry care products industry.

By exploring both breadth and depth in research findings, this mixed-methods technique improves the validity and dependability of the study's findings. A purposive sample technique will be used for this study in order to choose participants who have relevant experience and competence in the laundry care products sector. Consumers, merchants, manufacturers, and industry experts will all be included in the sample frame.

Manufacturers: A stratified sampling technique will be used to ensure representation from both large-scale and small-scale manufacturers. Key criteria for selection will include market share, geographic location, and product range diversity.

Retailers: Retailers will be sampled based on their involvement in the distribution and sale of laundry care

products. Both online and brick-and-mortar retailers will be included to capture diverse perspectives.

Industry Experts: Industry experts, including marketing professionals, consultants, and academics specializing in the laundry care products sector, will be purposively selected based on their knowledge and experience.

Consumers: A variety of consumer types will be recruited by combining convenience sampling and snowball sampling methods. To guarantee participation from a variety of target market sectors, participants will be chosen according to demographic traits including age, gender, income level, and geography.

Sample Size: Each participant group's sample size will be chosen using the saturation principles, which aim to reach data sufficiency when no new themes or information are revealed by additional data collecting. The ultimate sample size will vary depending on the information gathered for the study.

Data Collection: Various techniques, including as focus groups, questionnaires, and interviews, will be used to gather data, depending on the participant group. To obtain qualitative insights, manufacturers, retailers, and industry experts will participate in focus groups and interviews. Meanwhile, consumer surveys will be used to collect quantitative data.

Ethical Considerations: Prior to data collection, informed consent will be acquired from each participant, and steps will be taken to guarantee response anonymity and confidentiality. Protocols and ethical standards set by the appropriate institutional review boards will be followed in this study.

Data Analysis: The application of thematic analysis techniques will be used to identify themes, patterns, and connections in the qualitative data. To assess quantitative data, statistical tools will be used, generating descriptive statistics and inferential analyses as required.

Sampling in this manner will enable a comprehensive exploration of the challenges and opportunities in implementing marketing strategies for laundry care products, providing valuable insights for manufacturers and stakeholders in the industry.

Analysis of the Overall Impact and Variability of Marketing Strategies on Laundry Care Products Manufacturers using Neural Network (NN) Method

The network with seven input layers, ten covariate variables, one hidden layer, and one output layer is the one that best fits the data, as shown in Figure 1.

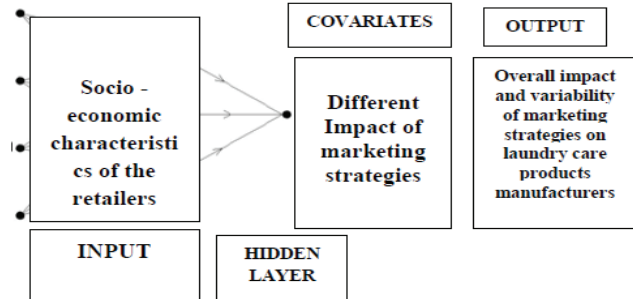


Fig. 1. The overall influence and diversity of marketing methods on producers of laundry care goods using a basic neural model

Using the Back Propagation Algorithm, the Feed Forward Multilayer Perception model is employed in this study. Where (4-3-1).

7-Input layers

10-Covariates layers

1-Hidden layers

1-Output layer

Every input is analyzed in the experimental validation step, and graphs illustrating the pertinent output results are used to make sure that the effects of the tensile strength parameters are taken into consideration. It shows a table with the network data in it. The figure shows the estimated NN and the confirmation of the experimental value depictions.

Table 1. Model Summary for Neural Network Model for overall impact and variability of marketing strategies on laundry care products manufacturers

Training	Sum of Squares Error	18.615
	Relative Error	.600
	Stopping Rule Used	1 consecutive step(s) with no decrease in error
	Training Time	0:00:00.02

Testing	Sum of Squares Error	6.790
	Relative Error	.359
Dependent Variable: The overall impact of the Marketing Strategies		
a. Error computations are based on the testing sample.		

Source: Output generated from SPSS 26.

Table 2. Neural Network Model for the overall impact and variability of marketing strategies on laundry care products manufacturers

Input Layer	Factors	1	Gender
		2	Educational
		3	Nature of Ownership
		4	Monthly Income from cosmetics
		5	Experience
		6	Products Covered
		7	Nature of the Product
	Covariates	1	Increases Sales
		2	Increases Profit
		3	Expands consumer base
		4	Short term increase in sales
		5	Helps in inducing first trial
		6	Stimulates consumer to buy
		7	Promotes demand
		8	Make consumers switch brands
		9	Supports salesmen to increase the sales
		10	It helps in selling slow moving products
	Number of Units ^a		34
		Rescaling Method for Covariates	Standardized
Hidden Layer (s)	No. of Hidden Layers	1	
	No. of Units in Hidden Layer 1a	2	
	Activation Function	Hyperbolic tangent	

Output Layer	Dependent Variables	1	The overall impact of the Marketing Strategies
	No. of Units		1
	Rescaling Method for Scale Dependents	Standardized	
	Activation Function	Identity	
	Error Function	Sum of Squares	
a. Excluding the bias unit			

Source: Output generated from SPSS 26

The Neural Network Method is used to simulate the aspects impacting the effective marketing strategies in the laundry care products model parameters. By employing Neural Networks Architecture and network information, the parameters are optimized to determine the set of factors that will influence the rise in the overall impact and variability of marketing tactics on manufacturers of laundry care products.

Table 3. Independent Variable importance for Neural Network Model for the overall impact and variability of marketing strategies on laundry care products manufacturers

Independent Variable Importance	Importance	Normalized Importance
Gender	.019	7.3%
Educational	.036	13.7%
Nature of Ownership	.013	5.1%
Monthly Income from cosmetics	.031	11.8%
Experience	.031	11.8%
Products Covered	.034	13.1%
Nature of the Product	.007	2.5%
Increases Sales	.029	11.2%
Increases Profit	.083	32.0%
Expands consumer base	.015	6.0%

Short term increase in sales	.029	11.3%
Helps in inducing first trial	.027	10.5%
Stimulates consumer to buy	.027	10.5%
Promotes demand	.028	10.6%
Make consumers switch brands	.087	33.7%
Supports salesmen to increase the sales	.247	95.3%
It helps in selling slow moving products	.259	100.0%

Source: Output generated from SPSS 21

In a neural network model that looks at the overall impact and variety of marketing strategies on laundry care product producers, the table shows the significance and normalized significance of independent variables. While the important values display the relative contributions of each variable to the model's projected accuracy, the normalized importance describes these contributions as percentages of the total importance. "Monthly Income from cosmetics" (Importance: 0.031, Normalized Importance: 11.8%), "Experience" (Importance: 0.031, Normalized Importance: 11.8%), and "Products Covered" (Importance: 0.034, Normalized Importance: 13.1%) all have relatively high importance scores, which suggests that they have a significant impact on the model's predictions. These elements most likely have a big impact on the development of marketing plans and the way laundry care product manufacturers are impacted.

There are also variables that stand out with particularly high importance scores, including "Increases Profit" (Importance: 0.083, Normalized Importance: 32.0%), "Make consumers switch brands" (Importance: 0.087, Normalized Importance: 33.7%), and "It helps in selling slow moving products" (Importance: 0.259, Normalized Importance: 100.0%). Particularly when it comes to influencing customer behavior and market outcomes, these factors seem to have the biggest effects on the overall efficacy and variety of marketing tactics. On the other hand, variables such as "Nature of the

Product" (Importance: 0.007, Normalized Importance: 2.5%) and "Nature of Ownership" (Importance: 0.013, Normalized Importance: 5.1%) exhibit comparably lower importance scores, suggesting that they play a very little influence in the model's predictions. Even yet, their impact seems to be less noticeable than that of other variables, even though they could still be a part of the total analysis.

In general, the examination of independent variable significance offers significant understanding of the primary factors influencing the influence and fluctuation of marketing tactics on producers of laundry care goods. Businesses can improve their competitiveness in the market and optimize their marketing strategies by making well-informed decisions based on their understanding of the relative importance of various elements.

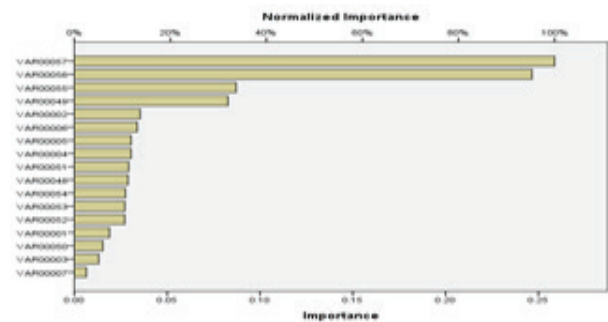


Fig. 2. Normalized importance for the overall impact and variability of marketing strategies on laundry care products manufacturers

For makers of laundry care products, this remark emphasizes the value of examining independent variables in order to comprehend the elements that affect the efficacy and unpredictability of marketing campaigns. The analysis clarifies the main factors influencing these methods' effects and the range of results they produce.

Businesses can discover which elements of their marketing strategies have the biggest impact on their success by knowing the relative value of various components. Companies may decide where to concentrate their efforts and devote resources to maximize their marketing strategies by understanding these important drivers. Moreover, companies can create plans to reduce risks and uncertainties by identifying the

elements that most influence the variation in marketing strategy results. Having this knowledge makes businesses more competitive in the market by enabling them to modify their strategies in response to shifting consumer preferences and market conditions. Basically, businesses may use the analysis of independent variable importance as a useful tool to improve their marketing tactics, increase their impact, and keep a competitive edge in the ever-changing market for laundry care goods. It helps businesses to better adapt their strategies to the demands and inclinations of customers, which eventually propels industry expansion and success.

SUGGESTIONS

Based on the findings, it is recommended for laundry care product manufacturers to prioritize marketing strategies that target specific demographic segments, such as gender and educational background, which have been identified as influential factors.

1. Companies should focus on enhancing product quality and expanding their consumer base to maximize the impact of their marketing efforts. Implementing promotional activities that stimulate consumer buying behavior and encourage brand switching can be beneficial in boosting sales and profitability. In order to create innovative products that meet changing consumer preferences and market trends, manufacturers should allocate resources to research and development. Collaborating with retailers to optimize distribution channels and improve product availability can further enhance the effectiveness of marketing strategies.

CONCLUSION

A neural network approach was used in this study to examine the general influence and variation of marketing tactics in the laundry care products industry. Significant new information about the variables affecting the efficacy of marketing strategies used by manufacturers in this cutthroat sector was uncovered by the investigation. The significance of several factors, such as product quality, education, gender, and promotional activities, in determining the effectiveness of marketing tactics is highlighted by key findings. Interestingly, elements

including boosting profits, encouraging brand switching, and promoting slow-moving products were found to be especially important in achieving successful marketing results. For producers of laundry care products looking to maximize their marketing expenditures, these results provide insightful advice. Businesses can increase their market competitiveness and boost overall business performance by giving priority to strategies that are in line with the influential variables that have been discovered. To improve marketing tactics and stay relevant in this ever changing industry landscape, more study into consumer behavior dynamics and market trends will be necessary in the future. Furthermore, the use of cutting-edge analytical methods like neural networks has the potential to improve the efficacy of marketing campaigns in the laundry care products industry.

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The Effects of Rewards and Recognitions on the Productivity of Employees in Coir Industry

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ABSTRACT

It is vital to know the Role of Rewards and Recognition needed for motivating the employees to get the Best Results. It is possible by identifying the output delivered by appreciated and non-appreciated employees. A better motivating system generates positive results for the sound growth of employees and business establishments. The descriptive research method was implemented for the present study. The participants are employees from different business establishments. We understood that many elements affect the level of motivation and satisfaction of employees. An interconnectedness exists among rewards & recognition, motivation, and job satisfaction. Accordingly, the output and its quality will fluctuate based on the level of rewards and recognition offered to employees. A better rewards and recognition system produces a higher level of motivation and satisfaction. It will lead to a greater level of performance and productivity.

KEYWORDS: Rewards, Recognition, Motivation, Job satisfaction, Fruitful results.

INTRODUCTION

Because employees are the basis of any organization and the final goal of human resource management, companies should reconsider their methods of internal communication. Employee morale will increase and integration efforts will gain momentum due to this. Considering the rapid evolution of society and the rapid development of technology and new ideas in the modern world. Employees can be incentivized to move up Maslow's hierarchy of needs and become more motivated to produce better work in exchange for various forms of reward, such as praise from supervisors, the ability to seek major projects or duties, and even leadership focus. [1]

Employee recognition serves as a measure of a worker's value to the organization, dedication, and enthusiasm for their work. It also includes taking account of and being grateful for the results of that effort. In essence, it highlights the significance of

each employee's specialized expertise and the unique value they bring to the company. [2] When a culture of gratitude is established, employees are more invested in the company's success. Each day brings new chances to show appreciation for someone's hard work without spending much money. [3] Informal awards are the cherry on top that keep staff members interested, motivated, and coming back for more. However, given the mixed consequences that appreciation has on both personal and organizational development, it is also crucial to research and comprehend how much of an influence the aforementioned elements have on the workforce. [4]

The study's main requirement is the introduction of creative employee recognition techniques. The report will assist businesses in developing new employee engagement initiatives. Future studies on employee engagement patterns might benefit from this information. [5]

REWARDS AND RECOGNITIONS' EFFECTS ON EMPLOYEES PERFORMANCE

In this section, we will examine the content theories of motivation in an effort to gain a better understanding of the concepts that have contributed to our current understanding of what motivates people. [6] There is constant demand for businesses to raise and improve their performance, and many are beginning to see the connection between the success of the company and the success of its employees. The next chapter will focus on motivational theories and how they might boost productivity in the workplace. More and more businesses understand they must reward employees fairly for the work they do and the benefits they receive from their employers. In order to achieve this stability, remuneration is often used. [7] The reward system's 3 primary elements—compensation, recognition, and benefits—are the core areas to be considered. According to research, the biggest problem that companies face today is failing to recognize the value of rewards as a low-cost, high-return part of a well-balanced incentive structure. The purpose of rewards and praise is to make workers feel appreciated and valued. Employees who are appreciated are found more creative and productive. [8] Management can utilize the reward system as an effective instrument to steer employee motivation in the desired direction. In other words, the purpose of incentive systems is to recruit talented people, retain them, and motivate them to give their all on the job. All parts of an organization are included in the reward system, like human resources policies, decision-making procedures, and activities involved in allocating benefits. The study contains the fundamental conceptual understanding of rewards and recognition as well as references to other researchers' work on the subject. [9]

IMPORTANT DISTINCTIONS

The ideas of consideration and reward are closely related to the notion of recognition. To properly define what constitutes recognition, we must consequently make a contrast between these ideas. The continuum of indifference and compensation will be used to achieve this.

Elements

Indifference: A Formal agreement between the employer and employee.

Consideration: A social connection among individual and an establishment. Human Resources are seen as intelligent, respectful people.

Recognition: a connection between two or more individuals. Employees are recognized for their hard work and dedication, as well as their achievements.

Reward: a formal, unbiased, and fair trade. a physical or monetary display of gratitude that is dependent on outcomes.

Compensation: The tangible and intangible benefits.

4. RESEARCH METHODOLOGY

Purpose of This Study

The study aimed to determine the impact of recognition and rewards on the morale of Human Resources. Specifically, we wanted to know what kinds of rewards and recognition workers respond best to, how much of an impact appreciation has on performance, whether or not motivation has an impact on both organizational and individual development, and whether or not recognition and rewards cause emotional conflicts among workers. It's an approach used in science that involves observing and recording data about a topic without interfering with their actions. Descriptive method used in this study to predict and explain the events.

Research Design

For this study, a descriptive research strategy was utilized. It displays the statistics and findings from the research.

Objective of Study

To examine the impact Rewards & Recognition and on organizational performance

To examine the major factors that increase the motivation of employees.

Research Questions

1. What is the major factor that increases the motivation of employees?

2. What is the impact of motivation on organizational performance?
3. How the employee motivation & organizational Performance are" interrelated?

Importance of the Study

The conclusions will help firms in the gas and oil industry as well as other organizations in recognizing the value of employee motivation.

Sample Size and Sample Design

Universe: The responders were a range of personnel from the firms.

Sample Size: Using 'convenience sampling,' a sample size of 50 employees was chosen.

The researcher chose the respondents based on their comfort level with ease of access, hence a sample design was used.

Tools of Data Collection: To gather information from the employees about the many facets of recognition and rewards that the researcher wanted, a questionnaire was created.

Source of Data Collection: Primary Data and Secondary Data

Pre-Testing

Ten respondents were given a limited-question, preliminary questionnaire by the researcher, who then examined the reliability of the findings gathered to see if any more revisions would be necessary.

Tools Used: Percentage method, Tabular column, correlation, Parametric and Non-Parametric Tests, etc.

FINDINGS

The information gathered by the researcher for their investigation on how recognition and rewards affect employee motivation. Employees of the study area provided the information that was gathered. Following the creation of a codebook, the data analysed. The conclusions were as follows:

Methods of Reward Policies

- Organizations of the respondents make reward choices in both formal and informal ways in 52% of the cases.

- Employee of the Month awards are given by 42% of respondents' employers.
- At staff meetings and other public gatherings, 26 percent of the respondents' companies used public praise of their employees as a form of informal rewards and recognition.
- A monthly rewards and recognition program was in place at 60% of the respondents' workplaces.

Mode of Recognizing Performers

- Increasing productivity, customer satisfaction, and new and creative ideas account for 56% of rewards and recognition.
- Group voting by 42% of the respondents' firms for rewards and recognition in all levels.
- According to 38% of respondents, rewarding an employee with a promotion based on performance is the best option.

Treatment of Non-Performers

- According to 44% of respondents, non-performers received skill-development training.
- According to 28% of the respondents, non-performers were removed from the job.

Effects of Rewards and Recognitions

- 46 percent commented that rewards and recognition cause employees' performance to improve.
- Regarding the idea that recognition and rewards lead to an attitude of overconfidence in the employee, 38% of the respondents were neutral.
- 42 percent of respondents agree that underappreciated employees are separated from those who are valued.
- 46 percent of respondents agree that motivation is increased by job satisfaction.
- 52 percent of respondents firmly agree that rewards and recognition boost motivation.
- According to 48% of respondents, employees go above and beyond to earn the ebenefts.
- 38 percent of commented that recognition & rewards obstruct career development for both individuals and organizations.

- 36 percent of respondents agree that recognition and rewards boost workers' loyalty to the organization.
- A company's increased level of motivation, according to 36% of respondents, is the greatest benefit of rewards and recognition.
- 48 percent of respondents agree that rewarded employees consistently exhibit great performance.
- In the view of 58% of the respondents, recognition and rewards need to be offered in front of the whole company.
- 52 percent of respondents said that their immediate manager or supervisor should be the one to provide recognition and rewards.
- Between performers and non-performers, rewards and recognition, according to 48% of the employees, may lead to emotional conflicts.

CONCLUSION

The results of this study make it abundantly evident that several factors influence the levels of inspiration and contentment among employees. [10] Understanding the positive relationship between recognition and rewards and motivation and job satisfaction was also critical. Worker motivation and satisfaction would shift accordingly if rewards and recognition were altered. This may be roughly translated as follows: better rewards and recognition lead to greater motivation and happiness, which in turn could lead to greater performance and output. Major discrepancies should prompt the organization to reevaluate and make necessary adjustments, particularly when there are emotional conflicts between performers and nonperformers. As per Maslow's hierarchy of requirements, the higher-level wants, which have an influence on motivation, cannot be fulfilled until the lower-level demands, like pay and bonuses, are satisfied. [11]

The results indicated that less awardees are less motivated. Since the corporation, and by implication the business unit, is undergoing transformation, some of these workers may decide to depart. Implementing a recognition-based retention approach would be beneficial for the business unit. As was already said, improving recognition and rewards might boost motivation and satisfaction. The research found that

acknowledgment entails both positive reinforcement and constructive criticism.

The study's findings suggest that managers can apply a wide range of methods to inspire their staff, but it's crucial for them to keep in mind that different approaches will have varying effects on employees. In order to achieve the best results from a motivating plan, managers must be aware of and able to comprehend obstacles. This requires an appreciation for the unique set of values, beliefs, and actions that each team member brings to the organization. [12]

Since an employee's circumstances, needs, and personal goals are dynamic and never remain the same for very long, it's crucial to remember that different motivational tactics may have different effects on an employee at different times.

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Challenges in Implementing the Marketing Strategies Adopted by the Laundry Care Products' Manufacturers

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ABSTRACT

Laundry care products encompass a wide range of consumer goods, including detergents, fabric softeners, and stain removers, among others. Effective marketing strategies are essential for manufacturers to differentiate their products, attract consumers, and remain competitive in the marketplace. However, several challenges hinder the successful implementation of these strategies. These challenges may include intense competition within the industry, evolving consumer preferences and demands, rising costs of production and distribution, regulatory constraints, and the need for sustainable and environmentally friendly practices. Understanding and addressing these challenges are critical for laundry care product manufacturers to navigate the complexities of the market and achieve their business objectives. In the laundry care products industry, this study emphasizes how critical it is to identify and address these issues in order to create consumer-friendly marketing campaigns that spur company expansion.

KEYWORDS: *Challenges, Marketing strategies, Laundry care products, Manufacturers, Competition, Consumer preferences.*

INTRODUCTION

A vast range of goods essential for fabric care and household cleaning are included in the laundry care products business, which is distinguished by its dynamic nature and intense competitiveness. Manufacturers in this sector continually strive to devise and implement effective marketing strategies to promote their products, attract consumers, and maintain market share. However, amid this pursuit of market success, manufacturers face a multitude of challenges that hinder the seamless execution of their marketing strategies. This examination seeks to delve into the challenges encountered by manufacturers in implementing the marketing strategies adopted for laundry care products. By delving into these challenges, valuable insights can be gleaned into the intricate dynamics that shape the marketing landscape within this industry. Understanding these challenges is imperative for manufacturers to formulate strategies that effectively address market demands, consumer

preferences, and industry trends while surmounting obstacles that impede their success.

Throughout this exploration, we will scrutinize key challenges such as intensifying competition, shifting consumer preferences, regulatory constraints, escalating production costs, and the growing necessity for sustainable and environmentally friendly practices. Each of these challenges presents unique hurdles that manufacturers must navigate to achieve their marketing objectives and maintain a competitive edge in the market.

The purpose of this paper is to provide manufacturers, marketers, and industry stakeholders with relevant insights into the complexities of laundry care product marketing strategy implementation by clarifying these obstacles. By having a thorough awareness of these difficulties, producers can come up with creative solutions, seize new chances, and get over roadblocks

to propel expansion and prosperity in the vibrant and constantly changing market for laundry care goods. The intricate connections and influences between business-use consumer message systems and consumer laundry practices are examined in this study using a coevolutionary method. The objective is to uncover system-level details regarding the reasons for business cases and how they impact and are mirrored in how clients respond to company communications. Because research conducted at the level of a single firm or industry may overlook feedback loops and effects at different scales, this approach is crucial. The value of coevolution as a tool for comprehending socio-technical transitions to sustainability has long been recognized. While acknowledging the partial autonomy of development within systems, it also highlights the importance of cause-effect-cause loops in systems at different scales. Variation, selection, and transmission are the three stages of evolution. Coevolution is the evolution of systems that consist of two or more populations through significant mutual causal pathways. Therefore, while each system affects the other, it does not entirely dictate it.

Murmann's seminal study [1], offers important insights into coevolutionary theories, especially when it comes to the historical evolution of interactions over a 60-year period between the connected academic system and the synthetic dye sector. He describes two essential elements for coevolutionary explanation: recognizing reciprocal causal mechanisms between the business and its environmental components, and understanding the sector and its factors as populations experiencing evolutionary development. The study builds on Murmann's model by investigating the coevolutionary dynamics between consumer washing behaviors and company communications, therefore elucidating the complex interplay between both systems.

REVIEW OF LITERATURE

The terms "green products" and "green consumption" have become commonplace, thanks to widespread business marketing campaigns and government promotion efforts. Despite the realization that some products labelled as "green" may not live up to their

claims, and that green consumption alone may not be the ultimate solution to climate change, the focus on environmentally conscious consumption remains strong. This attention persists among policymakers, marketing strategists, and researchers alike. Recognizing the importance of behavioral changes in laundry-related consumption patterns, particularly in the pursuit of environmental sustainability, is crucial [2].

The term "supply" refers to businesses that work directly with consumers and whose primary function is to sell products to consumers through manufacturing and retail channels. Contrarily, "demand" comes from the customers themselves, who interact with businesses through purchasing, utilizing, and receiving marketing materials from them. This study employs a business model innovation framework [4] to examine the factors that contribute to the spread of consumer messages aimed at lowering laundry emissions, in addition to looking at the drivers influencing changes in consumer laundry behaviors from a social practice perspective [3]. This methodology enables an inductive inference of the causal relationships that evolve over time between variations in the washing temperatures of customers and the communication strategies used by the organization.

The commercial strategies employed by manufacturers and retailers of laundry detergent are carefully examined in this study, which also explores the nuances of the causes that contributed to the adoption of lower temperature washing techniques. It investigates the ways in which behavioral and technical advancements impact this trend. Based on the studies of Murmann [1] and Foxon [5], this study uses a coevolutionary framework that has evolved over time to analyze the relative effectiveness of different voluntary business activities. This method allows for a comprehensive evaluation of the factors influencing the efficacy of these initiatives by acknowledging the interdependence of business strategies and customer behavior. The coevolutionary approach acknowledges the connection of managerial actions, technological and social interactions, and institutional consequences, which enhances our understanding of the dynamics at play. Additionally, by integrating stakeholder theory, resource-based view of the firm, and institutional theory, this study builds

on Mylan's [6] case study on P&G's efforts to change customer behavior for lower temperature laundry.

Companies don't usually try to change the way people use their products, but in some cases, they have recently tried to change domestic habits in order to encourage sustainable consumption. Interestingly, UK supermarkets have been quite important in efforts to decrease food waste at home [7]. Armstrong et. al [8] report that branded clothing companies, such as jeans brands and merchants, have also started to promote garment reuse. With the goal of engaging with people's daily lives on a deeper level, this essay aims to expand our awareness of corporate sustainable consumption programs. To that end, it looks into the "low-temperature laundry" case, which was an attempt to change the way that people do their laundry at home.

STATEMENT OF PROBLEM

In the realm of marketing strategies adopted by laundry care product manufacturers, a multitude of challenges hinder effective implementation. These challenges include the presence of unbranded products, which can dilute brand recognition and undermine marketing efforts. Moreover, the high degree of competition within the industry intensifies the struggle to stand out and capture consumer attention. Additionally, keeping track with changing trends and lifestyles presents a challenge, as manufacturers must continually adapt their marketing strategies to remain relevant and appealing to consumers [9]. Furthermore, selecting the correct marketing strategy becomes increasingly complex amidst evolving consumer preferences and industry dynamics. Moreover, consumers' demand for transparency on ingredients poses a significant challenge for manufacturers, requiring them to provide detailed information about product formulations while maintaining consumer trust. Providing personalized care and satisfaction adds another layer of complexity, as manufacturers must tailor marketing strategies to meet diverse consumer needs and preferences effectively. Additionally, the cost of land or rent can impact production expenses, affecting pricing strategies and overall competitiveness in the market. Furthermore, consumers' quality consciousness and sensitivity to product price further complicate marketing

efforts, necessitating careful consideration of product positioning and value propositions [10].

The implementation of marketing strategies for laundry care products presents a number of obstacles, including those related to competitiveness, consumer needs, regulatory compliance, and operational costs. Manufacturers must overcome these obstacles in order to create consumer-friendly marketing plans that will propel them to success in the fiercely competitive laundry care products industry.

RESEARCH OBJECTIVES

1. To systematically identify and categorize the primary challenges encountered by laundry care products' manufacturers in implementing marketing strategies, encompassing factors such as competition, consumer demands, regulatory compliance, and operational costs.
2. To examine the effectiveness of current marketing strategies utilized by manufacturers in addressing these identified challenges, and to propose recommendations for optimizing marketing strategy implementation to enhance competitiveness and market performance in the laundry care products industry.

RESEARCH METHODOLOGY

Using a mixed-methods research methodology, this study thoroughly examines the difficulties in putting the marketing strategies used by makers of laundry care products into practice. Key stakeholders, including manufacturers, retailers, industry experts, and consumers, will be surveyed using qualitative techniques including focus groups and in-depth interviews. By exploring underlying variables and contextual details, these qualitative data gathering methodologies will enable a detailed knowledge of the difficulties faced by producers in the laundry care products business. The frequency and importance of the issues that have been identified will be measured and examined using quantitative techniques, such as surveys and statistical analysis. A representative sample of producers, retailers, and consumers will get surveys in order to gather information on attitudes, opinions, and experiences about the application of marketing strategies in the laundry care products industry. To

find trends, correlations, and statistical significance between variables, statistical analysis methods including factor analysis and regression analysis will be applied. A thorough and triangulated understanding of the difficulties in putting laundry care product marketing strategies into practice will be possible through the integration of qualitative and quantitative data. The validity and reliability of the study results are improved by this mixed-methods technique, which enables the investigation of both breadth and depth in research findings. To choose participants with pertinent knowledge and experience in the laundry care products sector, a purposive sample technique will be used for this study. Consumers, industry experts, merchants, and manufacturers will all be included in the sample frame.

Manufacturers: A stratified sampling technique will be used to ensure representation from both large-scale and small-scale manufacturers. Key criteria for selection will include market share, geographic location, and product range diversity.

Retailers: Retailers will be sampled based on their involvement in the distribution and sale of laundry care products. Both online and brick-and-mortar retailers will be included to capture diverse perspectives.

Industry Experts: Based on their expertise and experience, industry professionals will be purposefully chosen, including marketing specialists, consultants, and academics with a focus on the laundry care products sector.

Consumers: A combination of convenience sampling and snowball sampling techniques will be used to identify a diverse range of clients. Participants will be selected according to demographic characteristics including age, gender, income level, and location of residence in order to ensure representation across a number of target market sectors.

Sample Size: Based on the concepts of saturation, the sample size for each participant group will be chosen with the goal of achieving data sufficiency—the point at which no new information or themes surface from additional data gathering. The ultimate sample size will be variable and dependent on the information gathered

for the research.

Data Collection: Depending on the participant group, several techniques such as focus groups, questionnaires, and interviews will be used to collect data. Consumer surveys will be used to acquire quantitative data, while focus groups and interviews with manufacturers, retailers, and industry experts will be used to obtain qualitative insights.

Ethical Considerations: Prior to data collection, all participants will be asked for their informed consent, and steps will be taken to guarantee answer anonymity and confidentiality. Ethical standards and procedures set by pertinent institutional review boards will be followed in this study.

Data Analysis: To find patterns, themes, and correlations in the qualitative data, thematic analysis approaches will be applied. Statistical software will be utilized to evaluate quantitative data, producing descriptive statistics and inferential analyses as needed.

Sampling in this manner will enable a comprehensive exploration of the challenges and opportunities in implementing marketing strategies for laundry care products, providing valuable insights for manufacturers and stakeholders in the industry.

USING KENDALL'S W TEST, THERE WAS A SIGNIFICANT DIFFERENCE IN THE MEAN RANKINGS OF THE DIFFICULTIES IN IMPLEMENTING THE MARKETING STRATEGIES USED BY THE MANUFACTURERS OF LAUNDRY CARE PRODUCTS

Null Hypothesis: There is no significant difference between mean ranks of the challenges in implementing the marketing strategies adopted by the laundry care products' manufacturers.

Alternative Hypothesis: There is a significant difference between mean ranks of the challenges in implementing the marketing strategies adopted by the laundry care products' manufacturers.

Table 1. The mean rankings of the difficulties in putting the marketing techniques used by the manufacturers of laundry care products into practice were markedly different, according to Kendall's w test.

Challenges in implementing the marketing strategies adopted by the laundry care products' manufacturers	Mean Rank	Chi-Square value	D.F	Asymp. Sig.
Existence of Unbranded products	5.29	12.359	8	.136
High degree of competition within the industry	5.04			
Keeping track with changing trends & life style	5.00			
Choosing correct marketing strategy	5.29			
Consumers demand more transparency on ingredients	4.77			
Providing personalized care and satisfaction	4.82			
Cost of land or rent	5.01			
Consumers Quality Conscious	5.09			
Product price	4.72			

Source: Output generated from SPSS 26

The table shows the findings of the Kendall's W test, a statistical method used to determine whether there are statistically significant differences in the perceived relevance of various difficulties experienced by manufacturers of laundry care products while putting their marketing strategies into action. From the prevalence of unbranded products to consumer quality consciousness, each row symbolizes a distinct difficulty. Higher ranks indicate greater perceived relevance. The "Mean Rank" column shows the average rank that the manufacturers assigned to each challenge. Higher values indicate more significant variations between the mean ranks of challenges. The "Chi-Square value" quantifies the degree of deviation from predicted values. Consumer quality consciousness and the presence of unbranded goods, for instance, have comparatively higher mean ranks and Chi-Square

values, indicating that manufacturers view these issues as more important. To determine if these differences are statistically significant, the p-value is provided in the "Asymp. Significant" column. The p-value in this instance is higher than the standard cutoff point of 0.05, indicating that although difficulties are viewed differently in terms of importance, these changes might not be statistically significant. All things considered, this research assists producers in identifying important areas of concern when formulating laundry care product marketing plans.

A variety of perceived difficulties in the sector are indicated by the results of Kendall's W test for significant variations between mean ranks of hurdles in adopting marketing tactics established by makers of laundry care products. The Chi-Square values linked to these challenges are moderate, indicating some variability in the rankings but not significant departures from expected values, even though challenges like the existence of unbranded products, intense industry competition, and consumers' quality consciousness show relatively higher mean ranks, suggesting they are more significant to the manufacturers. However, there are also significant mean rankings for issues including adopting the right marketing approach, staying on top of shifting trends and lifestyles, and customers' demands for greater ingredient transparency, demonstrating their significance in the marketing environment.

However, the Chi-Square values for these challenges are relatively lower, suggesting a closer agreement among manufacturers regarding their perceived significance. It's important to note that the p-values associated with all the challenges are above the conventional threshold of 0.05, indicating that the observed differences in mean ranks are not statistically significant. This suggests that while certain challenges may be perceived as more critical than others, the overall consensus among manufacturers regarding their importance is relatively consistent. In summary, while there are variations in the perceived importance of different challenges faced by laundry care products' manufacturers in implementing marketing strategies, these differences do not reach a statistically significant level, implying a general alignment in understanding the key challenges within the industry.

FACTOR ANALYSIS FOR THE CHALLENGES IN IMPLEMENTING THE MARKETING STRATEGIES ADOPTED BY THE LAUNDRY CARE PRODUCTS' MANUFACTURERS

Kaiser-Meyer-Olkin and Bartlett's Test

To determine the dimensionality of the difficulties laundry care product manufacturers encounter when putting their marketing strategy into practice, the study used factor analysis based on nine different claims. The dependability of the generated factor structures was then confirmed by testing the internal consistency of the item grouping. Nine factors have been recognized by laundry care product manufacturers as providing challenges when putting their marketing plan into practice. The following are linked to these factors:

1. The availability of unbranded goods
2. The intense industrial competition
3. Adapting to shifting lifestyles and tendencies
4. Selecting an appropriate marketing plan
5. Giving customers individualized attention and happiness;
6. Transparency regarding substances
7. Land or rent costs
8. Quality-Aware Consumers
9. The cost of the item

Table. 2 Kaiser-Meyer-Olkin and Bartlett's Test of the challenges in implementing the marketing strategies adopted by the laundry care products' manufacturers

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.729
Bartlett's Test of Sphericity	Approx. Chi-Square	195.999
	Degrees of freedom	36
	Significant value	.000

Source: Output generated from SPSS 26

Table 2 displays the results of the Kaiser-Meyer-Olkin (KMO) measure and the Bartlett's test of sphericity for the challenges in implementing the marketing strategies of laundry care product producers. Data suitability

for factor analysis is assessed using a statistic known as the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO). Most people believe that the KMO number in this case, which is 0.729, is appropriate. This demonstrates that the data acquired regarding the challenges faced by producers of laundry care products while putting their marketing plans into action is appropriate for factor analysis.

The Bartlett's Test of Sphericity is a statistical test that determines whether or not there is a significant difference between an identity matrix and a correlation matrix between variables, indicating a relationship between the variables. The approximate chi-square value in this instance, with 36 degrees of freedom, is 195.999. A significant difference between the correlation matrix and an identity matrix can be inferred from the extremely low (0.000) p-value. For further investigation, factor analysis makes sense because the variables (challenges) are related to each other. The data's eligibility for factor analysis about the challenges manufacturers face while implementing their laundry care product marketing plan is indicated by both the KMO measure and Bartlett's test of sphericity.

Table 3: Extraction Sums of Squared Loadings and Rotation Sums of Squared Loadings for the challenges in implementing the marketing strategies adopted by the laundry care products' manufacturers

Compon	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.031	33.678	33.678	2.106	23.405	23.405
2	1.150	12.775	46.453	1.902	21.136	44.540
3	1.130	12.551	59.004	1.302	14.464	59.004

Extraction Method: Principal Component Analysis.

Source: Output generated from SPSS 21

The results of Principal Component Analysis (PCA) regarding the challenges of implementing marketing strategies in the laundry care products industry are displayed in Table 3. Based on the Extraction Sums of Squared Loadings, the first principal component accounts for 33.678% of the total variance. In contrast, the second and third components account for 12.775% and 12.551% of the variation, respectively. With a combined contribution of 59.004% to the variance, these three components show a significant reduction in

dimensionality while maintaining a significant portion of the original data. The continuous pattern of the Rotation Sums of Squared Loadings after rotation indicates the dependability of the extracted components. Based on these findings, it is possible to distill the challenges into a more manageable set of components, allowing for a more practical understanding of the core factors influencing the implementation of marketing strategies in the laundry care products sector.

Table 4: Rotated Component Matrix of the challenges in implementing the marketing strategies adopted by the laundry care products' manufacturers

Challenges in implementing the marketing strategies adopted by the laundry care products' manufacturers	Component		
	1	2	3
Product price	.806	-.231	-.004
Providing personalized care and satisfaction	.741	.270	.080
Consumers demand more transparency on ingredients	.729	.403	.239
Cost of land or rent Consumers	.422	.738	-.013
Choosing correct marketing strategy	.056	.691	-.018
Quality Conscious	.394	.543	.137
Existence of Unbranded products	-.096	.505	.155
Keeping track with changing trends & life style	.006	-.037	.833
High degree of competition within the industry	.174	.202	.708
Extraction Method: Principal Component Analysis.			
Rotation Method: Varimax with Kaiser Normalization.			
a. Rotation converged in 5 iterations.			

Source: Output generated from SPSS 21

The statements are converted into 3 factors by using factor analysis.

The following four aspects related to the challenges in implementing the marketing strategies adopted by the laundry care products' manufacturers are converted into a single factor.

- Product price
- Providing personalized care and satisfaction
- Consumers demand more transparency on ingredients,
- Cost of land or rent

The following three aspects related to the challenges in implementing the marketing strategies adopted by the

laundry care products' manufacturers are converted into a single factor.

- Choosing correct marketing strategy
- Consumers Quality Conscious
- Existence of Unbranded products

The following two aspects related to the challenges in implementing the marketing strategies adopted by the laundry care products' manufacturers are converted into a single factor.

- Keeping track with changing trends & life style
- High degree of competition within the industry

Table 4 displays the Rotated Component Matrix, which is derived from Principal Component Analysis (PCA) and is a helpful tool for comprehending the underlying structure of challenges faced by producers in the laundry care products industry. The rotating components represent distinct elements that cover clusters of related challenges, allowing for a more thorough understanding of the complexities involved in putting marketing ideas into practice.

Component 1 appears to emphasize challenges associated with consumer-centric factors, as evidenced by strong loadings from challenges such as product pricing, personalized care and satisfaction, and consumer demands for ingredient transparency. This suggests that manufacturers must prioritize understanding and addressing consumer preferences and needs to effectively compete in the market.

Challenges with business operations and strategic decision-making are highlighted in Component 2, with significant loadings from issues with land or rent costs, choosing the best marketing plan, and guaranteeing customer quality consciousness. This element emphasizes how crucial strategic planning and operational effectiveness are to negotiating the industry's competitive environment.

The existence of unbranded products, keeping up with shifting trends and lifestyles, and dealing with intense industry competitiveness are all major loadings in Component 3, which represents difficulties arising from external market dynamics and industry competition. This element emphasizes how firms must adjust to changing

market conditions and successfully set themselves apart from the competition in a crowded market.

The Rotated Component Matrix helps manufacturers to focus their efforts and create focused plans to handle the complex facets of marketing strategy implementation in the laundry care products industry by outlining various dimensions of issues. Gaining insight into the fundamental causes of these difficulties can help decision-makers make better choices and improve the efficacy of marketing plans, which will eventually increase competitiveness and market performance.

SUGGESTIONS

- **Prioritize Consumer-Centric Strategies:** Given the emphasis on challenges related to consumer preferences and demands, manufacturers should prioritize consumer-centric strategies. This includes offering competitive pricing, enhancing product quality, and providing transparent information on ingredients to meet consumer expectations effectively.
- **Strategic Decision-Making:** Manufacturers should focus on strategic decision-making processes to address challenges related to business operations and marketing strategy selection. This involves conducting thorough market research, optimizing resource allocation, and identifying unique selling propositions to differentiate products in the competitive landscape.
- **Adaptability to Market Dynamics:** Given challenges stemming from external market dynamics and industry competition, manufacturers must remain adaptable and responsive to changing trends. This entails monitoring market shifts, anticipating consumer needs, and agilely adjusting marketing strategies to maintain relevance and competitiveness.
- **Innovation and Collaboration:** To overcome obstacles and propel success in the laundry care products market, ongoing innovation and cooperation with industry players are crucial. Manufacturers who want to stay ahead of the curve should embrace technology improvements, engage in R&D, and look for collaborations with retailers.

CONCLUSION

The study of the difficulties in putting marketing plans into action for producers of laundry care products demonstrates how complicated the market is. Although there are notable variations in the relative weights assigned to different tasks, these variations fall short of statistical significance, suggesting that manufacturers generally agree on these issues. The way marketing strategies are implemented is greatly influenced by elements including market trends, competitive dynamics, and consumer preferences. Manufacturers should prioritize consumer-centric initiatives, make strategic decisions, adjust to market conditions, and encourage innovation and teamwork going forward. Effectively handling these issues will help manufacturers become more competitive, satisfy customer demands, and succeed in the ever-changing market for laundry care goods.

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Leveraging the 7Ps Framework in Pharmaceutical Marketing: A Narrative Review

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ABSTRACT

Pharmaceutical marketing operates at the intersection of regulatory compliance, ethical considerations, and evolving market demands. This narrative review employs the 7Ps framework—Product, Price, Place, Promotion, People, Process, and Physical Evidence—to examine strategies for brand differentiation, patient engagement, and sustainable growth. Key findings highlight the integration of digital tools, such as AI and CRM systems, with traditional approaches to optimize operations and build trust. The review identifies regulatory constraints, the digital divide, and balancing global and local strategies as key challenges, while emphasizing opportunities in phygital engagement, sustainability, and patient-centric models. It concludes by calling for systematic research to map the impact of the 7Ps framework on marketing outcomes in a rapidly evolving pharmaceutical landscape.

KEYWORDS: *Pharmaceutical marketing, 7Ps framework, Patient-centric strategies, Digital transformation, Sustainable practices.*

INTRODUCTION

Pharmaceutical marketing is uniquely complex, requiring frameworks that address commercial objectives while navigating interactions among healthcare providers, patients, and regulatory bodies. While the traditional 4Ps of marketing—Product, Price, Place, and Promotion—offer a foundational structure, they fail to capture the relational and service-oriented dynamics essential in this sector. The inclusion of People, Process, and Physical Evidence in the 7Ps framework enables a more holistic approach to improving efficiency, customer experience, and trust [1]. The 7Ps have been widely applied in healthcare, significantly influencing service quality, patient satisfaction, and operational outcomes. For instance, Ravangard et al. demonstrated their impact on hospital selection [2], while Chana et al. highlighted the critical role of Process in enhancing patient satisfaction [3].

Background

The 7Ps framework addresses the complexities of pharmaceutical marketing, such as regulatory

compliance, ethical considerations, digital transformation, and market diversity. Regulatory guidelines, including the U.S. FDA's promotional standards and India's Drug Price Control Order (DPCO), ensure ethical marketing practices but often limit flexibility in pricing and promotions [4]. Digital transformation has introduced tools like AI-driven analytics, e-pharmacies, and patient-centric platforms, enabling personalized engagement strategies [5]. However, balancing global strategies with localized approaches remains a significant challenge, especially in competitive markets like India, which hosts over 76,000 marketed brands [6]. Studies underscore the importance of 'Physical Evidence' in building patient trust [7] and 'Process' in improving satisfaction [8], reflecting a broader industry shift toward societal and environmental responsibility.

Objectives

This review explores the application of the 7Ps framework in pharmaceutical marketing, focusing on its role in brand building, patient engagement, and sales

performance. Specific objectives include examining product innovation, pricing strategies, distribution models, and promotional techniques, while addressing emerging challenges like sustainability and digital integration. By providing actionable insights, the review emphasizes the importance of patient-centric approaches and highlights trends shaping modern marketing strategies.

METHODOLOGY

This narrative review synthesizes insights from diverse sources to explore the application of the 7Ps framework in pharmaceutical marketing. The narrative review method was chosen for its ability to integrate theoretical foundations, empirical evidence, and practical insights into a cohesive thematic analysis. A total of 122 sources were screened, comprising foundational textbooks (10), doctoral theses (20), government and industry reports (3), and peer-reviewed articles (88). These sources provided critical insights into key areas such as marketing fundamentals, doctor engagement strategies, regulatory trends, digital transformation, and sustainability.

By prioritizing thematic integration, this review highlights pivotal trends, including product innovation, ethical promotion, and patient-centric approaches, while addressing gaps in digital tool integration and sustainable practices. The review emphasizes the relevance of the 7Ps framework in navigating complex regulatory environments and competitive markets, particularly in contexts like India, which faces unique infrastructural and policy challenges. This condensed synthesis aims to provide actionable recommendations for advancing marketing strategies in the pharmaceutical sector.

7PS OF PHARMACEUTICAL MARKETING

The 7Ps framework, introduced by Booms and Bitner [1], extends the traditional 4Ps—Product, Price, Place, and Promotion—by adding People, Process, and Physical Evidence. This expansion accommodates service-oriented industries like pharmaceuticals, where customer experience, trust-building, and operational efficiency are critical to success. By integrating these elements, pharmaceutical marketing strategies can meet the expectations of healthcare providers (HCPs) and patients while adhering to ethical and regulatory

standards. Figure 1 illustrates the 7Ps framework, highlighting its application to pharmaceutical marketing and emphasizing the interconnectedness of these elements in driving patient-centric and efficient outcomes.



Fig: The 7Ps Framework in Pharmaceutical Marketing (Original creation by the authors)

Product

Pharmaceutical products—medications, therapies, and devices—form the cornerstone of marketing strategies. Differentiation through safety, efficacy, and innovation is crucial to maintain a competitive edge. For instance, the lifecycle management of blockbuster drugs like Lipitor and Humira has extended their relevance by introducing combination therapies and advanced delivery systems [2]. Personalized medicine and biosimilars further reflect the industry's evolution, addressing diverse patient needs while sustaining market competitiveness [3].

Price

Pricing strategies in the pharmaceutical industry balance profitability with accessibility, navigating challenges such as research costs, affordability, and regulatory controls. Tiered and value-based pricing models are widely employed. In price-sensitive markets like India, adherence to policies such as the Drug Price Control Order (DPCO) ensures affordability, while branded drugs justify premium pricing through innovation [4]. Generics, on the other hand, rely on competitive pricing to increase access to essential medicines [5].

Place

Distribution in pharmaceuticals combines traditional networks—wholesalers and pharmacies—with digital

innovations like e-pharmacies and telemedicine. Platforms such as NetMeds in India highlight the transformative potential of digital channels, especially for rural access [6]. Digital supply chain solutions also enhance logistical efficiency, enabling timely delivery and reducing costs [7]. These innovations are redefining how medications reach patients, seamlessly integrating traditional and modern methods.

Promotion

Promotional strategies target both HCPs and patients. Traditional approaches like detailing, Continuing Medical Education (CME), and sampling remain essential, but digital tools are revolutionizing engagement. For instance, AI-powered analytics allow companies to personalize promotional content based on prescribing patterns, optimizing outreach to HCPs [8]. Direct-to-consumer advertising, although restricted in many regions, is gaining traction in markets like the U.S., where it influences patient awareness and treatment preferences [9].

People

People are at the heart of pharmaceutical marketing, particularly sales representatives who serve as the primary link between companies and healthcare providers. Their ability to build trust, effectively communicate product information, and provide tailored support significantly impacts doctors' prescribing behavior [5]. Competency frameworks focusing on ethical promotion, continuous training, and data-driven insights ensure high-quality interactions that align with regulatory standards. These initiatives help sales teams meet the expectations of both doctors and patients, fostering ethical and informed engagement [8]. Beyond building trust, sales representatives play a pivotal role in supporting product lifecycle strategies, ensuring sustained relevance through lifecycle extensions like combination therapies and advanced delivery systems [11].

Process

Efficient processes are vital to pharmaceutical marketing, ensuring the smooth delivery of medications and services. Supply chain optimization, as exemplified by companies like Sun Pharma, reduces operational costs while ensuring timely availability of medicines [7].

CRM systems further enhance efficiency by enabling personalized interactions with HCPs and patients, tracking engagements, and maintaining regulatory compliance. Streamlined workflows not only enhance operational reliability but also strengthen trust among stakeholders [6].

Physical Evidence

Physical evidence includes all tangible elements that influence perceptions of pharmaceutical brands, such as packaging, labeling, and promotional materials. Innovations like child-resistant and biodegradable blister packs not only improve patient safety but also align with global sustainability goals [3]. Eco-friendly designs and branding reinforce trust in environmentally conscious consumers, while regulatory-compliant materials further ensure brand credibility. Companies investing in these practices enhance their reputation and meet the evolving expectations of healthcare providers and patients alike [5].

Integrating the 7Ps in a Digitalized Ecosystem

While the traditional 4Ps establish a strong foundation, the new 3Ps—People, Process, and Physical Evidence—are indispensable for navigating the unique challenges of the pharmaceutical industry. Together, the 7Ps framework offers a comprehensive model for addressing regulatory constraints, building trust, and meeting the evolving demands of healthcare providers and patients. The integration of digital tools such as AI and CRM systems further amplifies the framework's relevance in a rapidly digitalizing healthcare ecosystem. By embracing this holistic approach, pharmaceutical companies can foster innovation, enhance patient engagement, and achieve sustainable growth in a competitive and regulated landscape. Integrating digital platforms like e-pharmacies into the supply chain enhances access to medications while supporting sales representatives in reaching underserved demographics [11].

Challenges in Applying the 7Ps to Pharmaceutical Marketing

Pharmaceutical marketing operates within stringent regulatory frameworks like FDA guidelines and India's Drug Price Control Order (DPCO), ensuring ethical practices but limiting flexibility in pricing, promotion,

and distribution. Balancing these regulations with market objectives requires meticulous planning. Digital transformation and growing patient empowerment necessitate hybrid strategies that integrate traditional and digital engagement while addressing gaps in digital accessibility. Additionally, balancing global branding with localized approaches presents challenges due to differing regulatory, cultural, and economic factors, especially in adapting promotions and packaging.

Opportunities and Future Trends

Pharmaceutical marketing can leverage digitalization, phygital strategies, and sustainability to address evolving industry needs. AI, machine learning, and analytics enable personalized campaigns, predictive prescribing trends, and efficient supply chain management. Phygital strategies seamlessly combine physical and digital touchpoints, enhancing patient experiences through innovations like telemedicine and e-prescription systems. Sustainability drives eco-friendly packaging and green production processes, aligning with regulatory mandates and consumer preferences, thus enhancing brand trust and equity. Collectively, these trends empower pharmaceutical companies to achieve sustainable growth in competitive and dynamic markets.

CONCLUSION

The 7Ps framework is essential for addressing the unique complexities of pharmaceutical marketing, including regulatory compliance, patient-centricity, digital transformation, and brand differentiation. While traditional approaches provide a solid foundation, integrating innovations like AI-driven marketing, phygital strategies, and sustainability-oriented practices ensures continued relevance in the evolving landscape. Future research should focus on linking 7Ps strategies to outcomes like prescribing behavior, brand equity, and customer engagement. Exploring AI for segmentation and campaign optimization, assessing the impact of sustainability and patient-centric models on brand loyalty, and balancing global branding with localized adaptations are key areas. By addressing these priorities, pharmaceutical companies can enhance adaptability, align with ethical and regulatory expectations, and achieve sustainable growth in competitive markets.

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Pharma Marketing 2030: Transforming with Innovation and Skills

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ABSTRACT

This perspective explores the transformative journey of pharmaceutical marketing as it approaches 2030, shaped by evolution in technology, evolving healthcare needs, and stricter regulations. It examines how the industry can adopt innovative tools for personalized communication, integrate physical and digital marketing approaches seamlessly, and upskill teams to remain relevant and competitive. The growing need for patient-focused strategies and trust-building through ethical practices, this article outlines actionable steps for companies to adapt to change and leverage opportunities in a rapidly shifting landscape. By covering perspectives about innovation, ethics, and continuous learning, this paper provides a practical guide for the future of pharmaceutical marketing.

KEYWORDS: *Pharmaceutical marketing, Upskilling, Patient-centric strategies, Phygital marketing.*

INTRODUCTION

Pharmaceutical marketing is undergoing a profound transformation driven by technological progress, evolving healthcare needs, and increasingly complex regulations. Adapting to these shifts is no longer optional; it is essential for the sustainability of companies in a dynamic global environment. The shift toward data-driven and patient-focused approaches demands robust innovation and strategic foresight to address emerging challenges effectively [1], [2]. While digital adoption in marketing accelerated during the COVID-19 pandemic, gaps in omnichannel outreach and regulatory preparedness remain. Patients and healthcare professionals alike expect tailored, transparent, and ethical engagements. Meeting these expectations requires a delicate balance between embracing innovative strategies and maintaining compliance and trust [3], [4].

This paper envisions the future of pharmaceutical marketing in 2030, highlighting three critical pillars for success: leveraging emerging technologies, integrating physical and digital channels, and transforming workforce skills. Its focus is on providing effective

approaches to earn trust., addressing patient needs, and navigating regulatory challenges in a rapidly changing healthcare landscape

CURRENT TRENDS AND CHALLENGES IN PHARMA MARKETING

The pharmaceutical industry is undergoing a profound transformation, shifting from traditional approaches to dynamic, digital-first strategies. Omnichannel marketing, which integrates tools like social media and mobile platforms, has become essential for engaging both healthcare professionals (HCPs) and patients. Social media, in particular, facilitates direct-to-consumer advertising (DTCA) while promoting a two-way communication to build trust and loyalty [1], [3], [5]. Furthermore, advanced analytics enable companies to gain clearer understanding into prescribing behaviors and patient needs, Laying the foundation for personalized campaigns that resonate with diverse stakeholders [6], [7].

Patient-centric marketing has emerged as a cornerstone of the industry, In line with the wider shift toward value-based healthcare. By leveraging data analytics

and behavioral patterns, companies can design personalized campaigns tailored to individual patient needs, improving accessibility and outcomes while enhancing brand loyalty. Digital health applications and educational tools, for example, keep patients informed and engaged throughout their care journeys. As patients increasingly expect ethical and meaningful interactions, brands that prioritize transparency and trust are better positioned to succeed in competitive markets [4], [5].

However, regulatory challenges persist. Compliance with frameworks like GDPR and HIPAA demands stringent data governance practices, especially as companies adopt digital and data-driven tools [2], [3]. Multinational companies must also navigate inconsistent regional regulations, necessitating adaptable strategies for ensuring compliance across jurisdictions. Striking a balance between embracing innovation and adhering to regulatory standards is critical for achieving sustainable success in this evolving landscape [6].

INNOVATION DRIVING THE FUTURE OF PHARMA MARKETING

Technological advancements are reshaping pharmaceutical marketing, with tools like predictive analytics, blockchain, and augmented/virtual reality (AR/VR) driving transformation. Predictive analytics enables precise targeting by uncovering prescribing trends and designing relevant engagement strategies [1], [5], [6]. Blockchain ensures secure and transparent data sharing, fostering trust while meeting regulatory requirements like GDPR and HIPAA [3], [8]. AR/VR enhances physician understanding through immersive product demonstrations and virtual training for complex therapies [9]. Together, these innovations improve communication, build trust, and support knowledge-sharing across the healthcare ecosystem.

The rise of “phygital” marketing blends physical and digital channels to deliver consistent interactions. Hybrid engagement models, such as combining in-person visits with tele-detailing in rural India, bridge accessibility gaps, strengthen brand recall, and ensure timely information delivery [5], [10]. This integrated approach is particularly impactful in specialty pharmaceutical markets, where decision-making is complex. Technology is also transforming patient engagement. Digital platforms for chronic disease

management, such as those supporting diabetes and cancer patients, have shown significant success. These tools provide education, reminders, and lifestyle recommendations, improving therapy adherence and health outcomes [3], [6], [10]. Integrating emerging technologies with patient-centric strategies will remain crucial for meaningful engagement and trust-building in a competitive industry.

BUILDING FUTURE-READY TEAMS: SKILLS AND COMPETENCIES

The rapidly evolving pharmaceutical marketing landscape requires teams equipped with modern skills to stay competitive and adaptable. Digital fluency and proficiency in data analytics are now essential for processing complex information, enabling precise targeting, and fostering meaningful engagement with healthcare professionals and patients [6], [7], [8]. Teams must also develop data literacy to interpret and act on insights effectively, ensuring dynamic responses to market demands. Familiarity with emerging technologies, such as blockchain, further supports compliance and operational efficiency in an increasingly regulated environment [10].

A culture of continuous learning is vital for bridging knowledge gaps and keeping pace with technological advancements. Companies are tailoring training initiatives to meet role-specific needs, such as communication and e-detailing for medical representatives or omnichannel strategy development for marketing teams [10], [11]. Effective training programs combine digital modules with hands-on workshops, focusing on core areas like digital marketing, compliance, and emerging tools [11]. Leadership development programs are equally critical, fostering adaptive thinking and empowering leaders to guide their teams through organizational transformations. Collaborations with academic institutions and professional bodies for certification programs also ensure employees gain industry-recognized skills, building resilient teams capable of thriving in a dynamic industry landscape [8], [9].

REGULATORY AND ETHICAL CONSIDERATIONS

As pharmaceutical marketing increasingly incorporates advanced technologies, ethical considerations such as

fairness, transparency, and inclusivity have become critical. Ensuring the balanced use of data is essential to avoid biases that could marginalize certain groups. Ethical frameworks like the European Union's "Trustworthy AI" guidelines emphasize accountability, transparency, and human oversight in decision-making processes. To align with these principles, pharmaceutical companies must implement rigorous audit mechanisms that promote equitable engagement with patients and healthcare professionals [6], [9], [12].

Data governance is equally important for building trust and maintaining compliance in the digital age. Regulations such as GDPR and HIPAA demand secure and transparent data handling, requiring companies to establish systems that protect sensitive information. Blockchain technology offers an innovative solution by ensuring data integrity and enabling secure, traceable records while supporting adherence to privacy laws [3], [8], [10].

Multinational companies face additional complexities due to varying regional regulations. While developed markets enforce stringent data protection standards, emerging markets often lack comprehensive frameworks, necessitating adaptable compliance strategies. Addressing these regulatory disparities is not just a legal obligation but a strategic imperative. Companies that prioritize transparency and adopt robust governance frameworks can strengthen relationships with stakeholders and position themselves as ethical leaders in a highly regulated environment [5].

EXPLORING NICHE OPPORTUNITIES

The pharmaceutical industry is increasingly focusing on niche markets such as orphan drugs and digital therapeutics, which offer significant growth potential. Orphan drugs, developed to treat rare diseases, benefit from regulatory incentives like market exclusivity and expedited approval processes. These drugs not only address unmet medical needs but also generate substantial revenue due to limited competition [3], [5].

Digital therapeutics, which provide software-based interventions for managing chronic conditions, are becoming integral to healthcare. They offer scalable, evidence-based solutions for conditions such as diabetes, mental health, and other long-term diseases.

These tools align with the broader digital transformation of healthcare, improving patient outcomes and accessibility while reducing costs [10], [13].

These high-growth niches align with global healthcare priorities, including personalized care and patient-centric approaches. Orphan drugs address rare conditions while achieving strong profitability under favorable regulations. Digital therapeutics meet growing demands for accessible, cost-effective care by integrating seamlessly into digital health infrastructures [6], [10]. By investing in these high-growth niches, pharmaceutical companies can secure competitive advantages, drive meaningful innovation, and address future healthcare challenges effectively.

A ROADMAP FOR PHARMA MARKETING IN 2030

Pharmaceutical marketing in 2030 will rely on eight critical pillars for success. These pillars represent a comprehensive approach that integrates technology, ethical practices, and workforce development to navigate the rapidly evolving healthcare landscape. As shown in Figure 1, the eight pillars are: Personalization (Technology), Ethical Trust, Phygital Marketing, Patient-Centric Approaches, Regulatory Adaptability, Workforce Transformation, Sustainability, and Emerging Market Focus.



Fig 1: Key Pillars of Future-Ready Pharmaceutical Marketing 2030.

Personalization (Technology)

By 2030, personalization in pharmaceutical marketing will be crucial. Real-world data (RWD) and advanced analytics will allow companies to create targeted campaigns tailored to healthcare professionals (HCPs)

and patients. Integrating these technologies into salesforce systems will streamline communication and improve outreach efficiency, ensuring timely, impactful interactions across all channels [1], [6], [9].

Ethical Trust

Ethical marketing will be central to building trust. With increased data usage, companies must prioritize transparency and strong data governance. Blockchain technology can enhance data security, ensure compliance with regulations like GDPR, and safeguard patient confidentiality. By embedding ethical practices into operations, companies can build credibility, foster trust, and meet the growing demand for accountability in healthcare [3], [8].

Phygital Marketing

Phygital marketing, which integrates physical and digital engagement, will be vital. Combining in-person interactions with digital tools such as virtual detailing and mobile apps ensures consistent experiences across touchpoints. This approach is especially impactful in specialty markets, where decision-making is complex. For instance, hybrid models in rural India, blending face-to-face visits with tele-detailing, will bridge accessibility gaps and deliver timely information [6], [9].

Patient-Centric Approaches

Patient-centric strategies will take the lead, with digital platforms offering tailored education, medication reminders, and disease management tools. These services will empower patients to manage their health, improving outcomes and strengthening brand loyalty. By ensuring patients are informed, supported, and actively engaged in their treatment, companies will enhance both care and customer trust [4], [10].

Regulatory Adaptability

Navigating a complex regulatory landscape will be a challenge as companies expand globally. Regulatory adaptability will be critical for compliance with evolving laws and policies, particularly in emerging markets. Companies must align operations with global standards such as GDPR and HIPAA. By maintaining proactive compliance, pharmaceutical companies can mitigate risks, avoid penalties, and build stronger relationships with regulators [3], [12].

Workforce Transformation

A skilled workforce will be essential. To keep pace with technological and regulatory changes, companies must invest in continuous learning, especially in digital marketing, data analytics, and compliance. Leadership development programs will equip managers to guide teams through transformation. Collaborations with academic institutions will help employees stay ahead of industry trends, ensuring companies remain competitive [7], [11].

Sustainability

Sustainability will be increasingly important, with stakeholders demanding eco-friendly and socially responsible practices. Companies must adopt sustainable manufacturing processes, responsible sourcing, and eco-conscious packaging. Promoting sustainability within the organization will also attract partners and customers who value environmental stewardship, enhancing brand reputation and aligning with consumer expectations [9], [10].

Emerging Market Focus

Emerging markets will present significant growth opportunities. Companies must address challenges like limited healthcare infrastructure and affordability by adopting models such as mobile health solutions and telemedicine. By tailoring products and services to meet the unique needs of these markets, pharmaceutical companies can drive growth and contribute to global health outcomes [8].

CONCLUSION

Pharmaceutical marketing is undergoing a major transformation, driven by technological advancements, shifting patient needs, and increasing regulatory demands. Success will hinge on adopting innovative tools for personalized engagement, integrating physical and digital marketing channels, and building trust through ethical practices. Strong data governance, supported by technologies like blockchain, will ensure compliance and foster stakeholder credibility.

Equally crucial is workforce transformation. Upskilling in digital fluency, data analysis, and adaptability will enable teams to stay competitive. By embracing continuous learning and aligning strategies with future

needs, pharmaceutical companies can drive sustainable growth, strengthen relationships with healthcare professionals and patients, and contribute to global healthcare advancement. The time to act is now.

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Social Responsibility, An impetus to technological innovation and Social Entrepreneurship: A Case Study

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ABSTRACT

Development brings freedom, provided it is development of people. But people cannot be developed; they can only develop themselves.

Julius Nyerere

Entrepreneurship has become a major driver of development. An entrepreneur by taking risks, initiates a business which creates job, helps in economic growth, and brings social change in the society. Social entrepreneurship is a powerful force for positive change. It tackles persistent social issues with innovative and business-minded approaches, creating sustainable solutions that benefit both society and the entrepreneur. A nation's economic strength relies on its workforce's skills and productivity. When more people are productively contributing, it leads to a larger, more skilled workforce which improves the standard of living for everyone. However, factors like lack of education, training, or access to opportunities hinder the potential to capitalize on the latent skills or talents of the masses. This case study based on unstructured interviews, highlights the journey of a woman entrepreneur Mrs. Rupjyoti Saikia Gogoi and her project 'Village Weaves' in Kaziranga, Assam which pinpoints to the innate sense of social responsibility as a key to overcome such hindrances and create a groundwork for technological innovations. The paper showcases the aspect of individual social responsibility as carried out by her, thereby displaying a case for social entrepreneurship. The primary goal of village weaves was to focus on preserving the practice of traditional weaving by involving village women and promote the idea of repurposing plastic through the technological innovation of blending waste plastic with cotton yarn in the loom. The case further emphasizes on the lack of awareness of adequate policy measures especially in the context of marketing of handcrafted products and the societal gap that acts as stumbling block to social entrepreneurship.

KEYWORDS: *Social entrepreneurship, Individual social responsibility, Traditional weaving.*

INTRODUCTION

Social entrepreneurship acts as a major tool for both social and economic renaissance in society. It brings a kind of holistic development for the economy through creative means and awareness of the social set up. It is distinctly different from entrepreneurship in the sense that it focuses not just on economic enterprise creation, but also on social and environmental aspects. According to Lehner [1], "social entrepreneurship" describes a non-governmental organisation's business plan that uses market-oriented and revenue-generating techniques to address social challenges and meet

needs in order to attain sustainability. The increasing pressure of differences in the distribution and access to resources has pushed certain individuals towards socially beneficial entrepreneurial activities. The Amul Dairy Cooperative and the Land Gift Movement were the first notable historical figures that paved the way for social enterprises in India [2]. It is believed that social entrepreneurs are essential in providing opportunity and basic amenities to India's undeveloped areas [3]. However, a regular professional path is not the same as the road of social entrepreneurship, which entails significant risk and uncertainty [4]. Hence there is the

need to identify and understand the drivers of social entrepreneurship. Amongst diverse factors that give birth to social entrepreneurs, the urge to be socially responsible stands as a distinguishing individual factor. This paper is an attempt to analyse the factor of individual social responsibility as the driving force behind social entrepreneurship undertaken by Smt. Rupjyoti Saikia Gogoi, the subject and contributor in the study.

Objectives of the study

1. To identify the drives that indicates social responsibility and the measures undertaken.
2. To study the challenges of fulfilling the drives to be socially responsible.

METHODOLOGY

This paper has been designed on the basis of a case study on Smt. Rupjyoti Saikia Gogoi from Assam. Both primary and secondary sources of information provided the requisite data for the study. Interview is the main method of primary data collection, while literature from electronic data sources such as e-publications and social media provide the secondary data.

LITERATURE REVIEW

The concept of social responsibility echoes the age-old tradition and culture of community well-being by community members themselves. Based on altruistic principles, social responsibility facilitates a positive milieu for one and all. According to Pacesila [5], individual social responsibility (ISR) is one of the branches of social responsibility that reflects the perception of individuals towards helping the society.

A case study through interview method by Datta & Gailey (2012)[6] highlights how their business endeavours have made the women more capable of supporting their families, developing entrepreneurial behaviours, and ensuring financial security. Tiwari et al. (2017)[3] observes that self-perceived creativity of students is associated with increased levels of social entrepreneurial intent, as such supporting a strong bonding between creativity and social entrepreneurial intentions. Another case study by Natrajan (2019)[7] in his study shows that lack of government support, lack of training, poor communication and infrastructure were the

main hindering factors of women social entrepreneurial ventures in Tamil Nadu. Hazarika (2020)[8] pointed out that motivating factors like social prestige, practice of SHG, uncontrollable circumstances like death of husband etc have initiated women entrepreneurship in rural Assam.

The findings of the study by Bhatt and Borpujari (2023)[9] propound the self independence aspect for women entrepreneurs and the creation of employment opportunities in their area with an improvement in their social status.

It is observed that there have been researches on social entrepreneurs, women entrepreneurs and factors impacting entrepreneurship. However, studies on social responsibilities on an individual front have been scarce. This study intends to understand how an individual sense of social responsibility turned Smt. Rupjyoti Saikia Gogoi into a social entrepreneur.

Background of Smt. Gogoi

Smt. Rupjyoti Saikia Gogoi received her schooling in Golaghat district and graduated in English literature from Jogananda Deva Satradhikar Goswami College, Bokakhat. A Diploma holder from Sankari Sangeet Vidyalaya in music, Smt. Gogoi began her professional career as a school teacher serving both the public and private sector institutions.

Traditional handloom weaving was her mother's daily chore as witnessed by Smt. Gogoi since her childhood and with prevailing societal expectations and the pressure of sustaining her domestic obligations, she learnt the art and skill of weaving from her mother. However, it was not until the growing interest of tourists visiting Kaziranga towards understanding the lifestyle of the people of the region and the practice of weaving that Smt. Gogoi decided to scale up the weaving practice amongst the women there. The rural Assamese population's lower socio-economic classes rely on this handloom weaving as a source of income and this industry has been essential to the economic development of the rural masses in Assam, giving millions of weavers and craftspeople in rural regions a means of subsistence.

Village Weaves (2004)

Smt. Rupjyoti Saikia Gogoi felt the need of empowering the women residing in and around the Kaziranga National Park. Her project 'Village Weaves' is a handloom start up and a self-help group curated with the aim of providing training to rural women in traditional handloom weaving as a means of livelihood generation. Smt. Rupjyoti Saikia Gogoi began her venture by visiting them door to door, sharing her ideas and also highlighting the significance of handloom as a source of livelihood for them. She formed an SHG and started her project with only 10 ladies.

She took this business ahead and engaged her team to make traditional Assamese apparel, purses, curtains, tablemats, pillow covers, wall hangings, and other items because she had received training from the North Eastern Development Finance Corporation Ltd. These are then marketed through agencies, social media sites like Facebook and Instagram, and an outlet named KazirangaHaat (she is also the proprietor of KazirangaHaat, Trade Center of Handloom Products and M/S Artistic Traditional Textile, Handloom Industry). Along with the team, they also involve professional designers who provide excellent ideas and are incorporated into Village Weaves.

Other Activities of Smt. Gogoi

In addition to being a weaver, Smt. Rupjyoti Saikia Gogoi is an environmentalist. She was cognizant about the environmental hazards owing to the excessive usage of plastic in and around the sanctuary. Thus, she initiated weaving of the recycled plastic threads on her loom without the use of machines to produce many unique products like mats, runners, doormats, handbags, etc. Another initiative of Smt. Gogoi is 'Rup's Kitchen', a café providing local cuisines to the tourists through pre-booking facility. Apart from food they also represent the North East culture through dance and various forms of art and folk music.

Training Programmes

Smt. Gogoi has trained more than 2000 people till date in diverse areas of weaving, culinary practices, up cycling and recycling as well. Some of the training programmes worth mentioning includes training on Assamese handlooms, recycling waste, and Assamese recipes for

overseas students studying e-commerce in Mumbai, instruction in weaving and handicraft manufacture under a collaborative work between The Corbett Foundation and the Arunachal Forest Department, Mabusa Basti in Arunachal Pradesh and also in Bokakhat, Numaligarh, and Jakhalabandha. She has also participated in a number of national and state-level trade shows, including the National Exhibition and Commercial Trade Fair held in Mumbai, Delhi, Gujarat, Kolkata, and Dehradun. Smt. Gogoi was awarded by the Balipara Foundation Naturenomics Award in collaboration with Call of the Wild Sanctuary Asia in 2015, Phukonram Gogoi Tourism Award Winner for Emerging Entrepreneur in 2015, Bokakhat Sub Divisional Administration's 2018 Industrial Woman Award, and many more.

TECHNOLOGY IMPLICATIONS

This case of social entrepreneurship is worth mentioning in regard to the blend of innovative concepts of plastic repurposing and the use of traditional weaving technology. The technique adopted is founded on the fundamental weaving formula of categorising the silk thread to be woven in to the loom as Digh and the Bani, whereby the plastic thread is placed as the bani and the cotton thread works as the digh. The first step is cleaning and washing of the plastic which is then sun dried. Thereafter it is shredded into fine threadlike pieces and placed into the loom horizontally as the bani to weave the requisite patterns. This technique ensures an even balance of both plastic and cotton in the material thus woven which further secures the strength and durability of the products created. This method is developed to create convenience for every woman in the locality to continue with their usual weaving along with repurposing plastic on a regular basis.

DRIVES AND MOTIVATIONS

Drives indicate a specific feeling that makes an individual take up a particular step. In the context of emotional intelligence and social entrepreneurial intentions, mentions that the likelihood of becoming involved in other people's problem-solving increases when one is able to evaluate and assess the emotions of other people's situations. The subject of the study revealed certain mental states in the form of feelings and experiences which have been phenomenal in initiating

first moves in that locality. Table 1 presents these drives along with the actions undertaken.

Table 1: Drives and actions taken

Sl. No.	Drives	Action Taken
1.	Realisation of the need to develop the women of Kaziranga	Started training the women to weave.
2.	Identification of lack of education as hindrance to women livelihood	More training on handloom and handicrafts for commercial purposes.
3.	Realisation of the need to preserve the art of handloom weaving	Engaging more women and youth to come forward to learn weaving.
4.	Bothered by the issue of measures to focus on the community development in Kaziranga apart from animals	Invest in training and other resources to continue the efforts initiated by her for empowering the women of Kaziranga.
5.	Conscious of the need to give due recognition to artisans at national and global level	Coordinating with interested stakeholders to establish the identity of the artisans at trade fairs and facilitate exports.
6.	Awareness of the grave danger of plastic pollution in Kaziranga	Developed the plastic weaving concept.

(Source: Based on interview conducted)

CHALLENGES

The subject in the study expressed certain challenges in the process of executing the personal urge to be socially responsible and take entrepreneurial initiatives in the interest of the society. These have been listed in Table 3 as the challenges which can be further studied as stumbling blocks to social entrepreneurship.

Table 3: Challenges of fulfilling the drives to be socially responsible

Problem identified	ISR	SE initiatives	Challenges
Illiteracy and lack of women empowerment	Accelerate a secure livelihood generation procedure for the women.	Form SHG to train the women on handloom weaving and handicrafts.	Overcoming the orthodox mindset of the community.

Art of traditional weaving is dying out gradually	Make the youth understand the value of the art of traditional weaving and the need to preserve it.	Organise training programmes	Mobilising the uninterested youth
Immense plastic waste generated	Tackling plastic waste problem in Kaziranga	Collect kitchen plastics and weave them into household products	Large scale plastic and non-household plastic collection is difficult to collect.
Limited reach and sales due to inadequate marketing knowledge	Find a better market for their products at national and international level.	Set up Village Weaves and Kaziranga Haat. & collaborate with international clients.	Absence of modern looms and usage of traditional looms limiting the production.
Lack of recognition of local artisans	Showcase the local artisans at a larger platform for recognition and secure direct benefits to them	Connecting with interested parties like NGOs and other individuals	Exploitation by some NGOs and lack of proper guidance

(Source: Based on interview conducted)

CONCLUSION

Social entrepreneurs act as social change makers through their entrepreneurial ventures directed towards social issues. As revealed by the case study, the urge of being personally responsible towards resolving community and environmental issues provided the impetus to be socially enterprising. Mrs. Rupjyoti Saikia Gogoi and her entrepreneurial ventures highlight the role of ISR as the starting point for social entrepreneurship. ISR is that intrinsic quality which pushes an individual to take the first mover steps. Nurturing prosocial behaviours and creating conditions for practising civic skills enables the

fostering of ISR amongst children and the adolescents which in turn can enable more social entrepreneurship in the society. However, more research in the context of individual social responsibility furthering the concept of social entrepreneurship and technological innovations is essential.

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Integrating Digital Technology in Wetland Management: Exploring the Case of Deepor Beel

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ABSTRACT

The importance of digital technologies is immense in improving the conservation endeavours of wetlands especially in supervising and managing ecosystems like Deepor Beel. This paper investigates how advanced digital tools such as remote sensing, Geographic Information Systems (GIS) and continuous water quality monitoring can be used for the conservation of biodiversity, ecological health etc. But the sustainability of Deepor Beel as a biodiversity hotspot is hit by challenges such as urbanization, water pollution and invasive species, casteism apart from climate change. The collection of data, monitoring how habitats are changing and enabling local community involvement in conservation also all become much easier through the inclusion of digital technologies into efforts. Global case studies, which highlight the relevance of digital tools for similar problems to those faced by wetland ecosystems are illustrated in this paper. The findings call for future investigations and policy undertakings to exploit digital technologies in enhancing the long-term ecological sustainability of Deepor Beel, eventually achieving environmental sustainability at large.

KEYWORDS: *Digital technologies, Wetland conservation, Deepor Beel, Biodiversity, Ecological sustainability.*

INTRODUCTION

Biodiversity, green infrastructure (GI), and wetlands form a vital nexus important for maintaining ecological equilibrium, especially in rapidly urbanising colonies. There is an increasing pressure on the ecosystems owing to accelerated industrialization, urbanization, and climate change. New strategies are required to conserve and improve these fundamental systems. Green infrastructure comprises of is made up of structured systems of natural and semi-natural spaces, such as parks, wetlands, and green corridors that offer vital ecological, social, and economic advantages [1]. GI contributes to improvement of human well-being and conservation of nature by promoting sustainable urban development. The term ‘biodiversity’ encompasses

plants, animals, and microorganisms along with their genetic diversity within different ecosystems. Green areas support ecological processes, creates habitats, and increases resilience to environmental disruptions. Among the most important elements of green infrastructure are wetlands. Wetlands act as natural buffers, reducing the risk of flooding, eliminating pollutants, and sustaining diverse species of plants and animals. Urban areas call for ardent wetland conservation not only for social and economic well-being, but also for environmental sustainability. Integrating these natural topographies into urban planning aids in the maintenance of healthy and bio diverse terrains which sustain ecological health and create vital ecosystems for posterity. Deepor Beel is one such landmark wetland of Assam which serves as

an example of interaction between GI and biodiversity. It encompasses crucial ecosystem amenities like habitat for varied species, particularly migrating birds, and flood control and water purification. Moreover, Deepor Beel serves as a reservoir of resources for farming, fishing, and ecotourism, thus enhancing local livelihoods [2]. The sustenance of wetlands, however, is victimized by rapid urbanization, unplanned industrial endeavours, and environmental corrosion, thereby depreciating the water quality, habitats, and biodiversity at a go. Deepor Beel is currently at an acute juncture in its life cycle, and its ecological and socio-economic position needs to be preserved. These issues are central to the essence of Sustainable Development Goal 9 (SDG 9), which prioritizes innovation, resilient infrastructure, and sustainable industry. Deepor Beel generally represents an environmental asset but it is a key aspect to achieve these objectives through promotion of innovation in managing the environment, building local infrastructure, and optimising opportunities for sustainable economic growth through eco-tourism. Besides, the rich biodiversity of the wetland presents a huge opportunity for bioprospecting, which may generate novel findings in the domains of biotechnology, medicine, and other areas.

Several strategies may address the ongoing deterioration of Deepor Beel. Digital technology and information and communication technologies (ICTs) offer relevant solutions to numerous problems faced by wetlands like Deepor Beel. Technology can foster efficient conservation, restoration, and sustainable management by integrating remote sensing, Geographic Information Systems (GIS), real-time water quality monitoring, and biodiversity data analytics [3]. These digital platforms not only improve data collecting and monitoring accuracy, but also cultivate community engagement and awareness for better solutions. Deepor Beel can enrich its defence mechanisms against pollution, invasive species, and urban sprawl by applying digital technologies while promoting sustainable economic growth in the vicinity. The current study examines the use of digital technology in Deepor Beel conservation, drawing inspiration from successful global wetland conservation initiatives namely, Everglades Restoration Project in the USA [3], Camargue Wetland Conservation in France [4], and Nairobi River Basin Rehabilitation

Program in Kenya [5]. Pondering over these global sites offer valuable insights for the preservation of Deepor Beel by exhibiting the value of integrating digital tools into wetland management. The present study seeks to determine whether use of digital technologies can enrich the preservation of the ecological integrity of Deepor Beel while also advancing innovation and sustainable infrastructure (SDG 9). The conservation efforts at Deepor Beel can be reinforced by embracing technology-driven solutions, assuring that it operates as a safe haven for diverse wildlife species by providing essential ecosystem services, and supporting the local residents.

CHALLENGES FACING DEEPOR BEEL WETLAND

The biodiversity and ecological sustainability and integrity of Deepor Beel, are in danger due to several issues among which infrastructure development and urbanization are more pressing. The environment of the wetland has been affected by the accelerated urbanization areas surrounding Deepor Beel leading to pollution, habitat loss, and disturbed hydrological patterns [4]. Studies reveal that uncontrolled urban growth has resulted in the infiltration wetland areas, waning natural habitats and rise in vulnerability of the regional biodiversity [2]. Water contamination has emerged as a major problem, mainly caused by untreated sewage and industrial waste. Research indicates that the water quality of Deepor Beel is deteriorating which causes eutrophication that is detrimental to aquatic species and the general health of the ecosystem. Communities dependent on these water supplies for their daily requirements are at peril for health problems as a result of this contamination [8]. The introduction of invasive species further complicates the ecological landscape of Deepor Beel which can out compete native flora and fauna for resources, disrupting the balance of the ecosystem and diminishing local biodiversity. These problems are worsened by climate change, putting more stress on the wetland ecosystem due to changing rainfall patterns and intensifying extreme weather events [6]. Conservation efforts are further hampered by the sparse community involvement and understanding of the biological magnitude of Deepor Beel, thereby highlighting the need for further education and

interaction. In order to manage the resources of Deepor Beel effectively, the issues need to be addressed with a multifaceted strategy which utilizes cutting-edge digital technology and ICT tools into conservation efforts, thus improving community engagement, data gathering, and monitoring.

GLOBAL CASE STUDIES IN WETLAND CONSERVATION

Preservation of wetlands promotes sustainable development, conservation of biodiversity, and sustenance of ecosystem values. A number of cases around the world emphasize the use of state-of-the-art technologies for managing and restoring wetland ecosystems successfully.

Nairobi River Basin Rehabilitation (Kenya)

The Nairobi River Basin Rehabilitation project utilised digital tools like Geographic Information Systems (GIS) and remote sensing to address issues of urbanization and pollution making it easier to monitor pollution levels and assess land use patterns within the basin [7]. GIS has enabled spatial analysis of environmental data there by identifying pollution hotspots and generating focused solutions. Besides, remote sensing enhanced the resource management initiatives by furnishing real-time data on fluctuations in land cover and water quality. Community engagement is a key element which uses digital platforms to educate the local populace regarding consequences of pollution and sustainable practices, thus fostering a sense of stewardship and responsibility for the river basin.

Camargue Wetland Conservation (France)

Camargue wetland in Southern France is haven to abundant biodiversity, particularly the bird populations. The preservation of this region utilised modern technology for protection of habitat as well as water management. Water quality and levels are monitored by digital monitoring systems making use of satellite imaging and on-site sensors necessary for maintaining equilibrium to the ecosystem sensitivity[8]. Prompt modification of water management strategies, provisioning of suitable circumstances for the diverse plants and animals have been enabled owing to the usage of such technologies. Moreover, community-based engagement strategies have been executed with

the assistance of local stakeholders for conservation and monitoring initiatives. Workshops and mobile applications have increased awareness of the residents regarding the ecological significance of the Camargue wetlands, thereby boosting public support for conservation efforts.

Lake Biwa Environmental Conservation (Japan)

Lake Biwa in Japan is considered to be a crucial biological and cultural resource which is not free from pollution and habitat deterioration. The Lake Biwa Environmental Conservation project uses remote sensing and data analytics to improve water quality and restore biodiversity. Remote sensing enables the identification of land use trends and patterns for comprehensive monitoring of pollutant components and formulate prediction models for treatment of water quality. This project serves as a perfect example for hydrological management to preserve the biological balance of the lake and avoid excessive nutrient outflow which intensifies eutrophication [9]. Community involvement is essence to the project as citizen science initiatives motivate nearby citizens to take part in monitoring activities, thus enabling spread of environmental awareness and encouragement to sustainable practices.

Everglades Restoration Project (USA)

Everglades Restoration Project is one of the largest projects which aims to preserve the ecosystems of Florida. Digital hydrological models and real-time water monitoring devices are used to effectively manage water flow and quality. Water resources management is aided through simulation of diverse hydrological scenarios facilitating relevant decision making [10]. Furthermore, Due to real-time monitoring system in place, continuous information on salinity, nutrient concentrations, and water levels can be accessed, thereby enabling adaptability to dynamic scenarios. Additionally, data-driven decision-making is the core of the project, whereby digital platforms disseminate monitored outcomes and raise public awareness of the importance of wetland protection and improve stakeholder interaction. This all-encompassing strategy highlights the importance of the integrated management techniques to manage ecological balance.

APPLICABILITY OF DIGITAL TECHNOLOGY TO DEEPOP BEEL

Deepor Beel has immense prospective for conservation and sustainable management owing to evolution of digital technologies. Stakeholders can tackle environmental challenges, stimulate community involvement in conservation plans, and enhance their understanding of the ecological dynamics of the wetland by incorporating modern tools like community engagement via digital platforms, IoT-based water quality monitoring, and remote sensing.

Remote Sensing and GIS

The use of Geographic Information Systems (GIS) and remote sensing is essential for tracking habitat degradation, water quality, and changes in land use in Deepor Beel. Technologies like high-resolution satellite photography and aerial surveys are used to record urban sprawl, the spread of invasive species, and shifts in hydrological patterns. GIS makes spatial analysis easier for formulating focused strategies for conservation and indicate trends in change of habitat and land degradation [6]. For instance, remote sensing can assist in evaluating changes in vegetation cover over time, offering vital information for habitat restoration initiatives and influencing land-use planning choices. By continuously monitoring these parameters, stakeholders can implement timely interventions to mitigate adverse effects on the ecosystem.

Water Quality Monitoring Systems

Using real-time water quality monitoring systems, which incorporate Internet of Things (IoT)-based sensors, is crucial for controlling industrial and agricultural runoff in Deepor Beel and determining pollution levels. These sensors enable prompt reactions to pollution levels by continuously monitoring parameters like pH, turbidity, dissolved oxygen, and nutrient concentrations. When pollution levels rise above predetermined thresholds, for instance, IoT systems can notify authorities, enabling prompt action to reduce contamination[9]. The ecological integrity of the wetland is protected by placing these monitoring systems, thereby improving the overall management of water resources.

Biodiversity Data Analytics

Digital biodiversity monitoring techniques are essential for tracking species populations, managing invasive species, and supporting habitat restoration initiatives, Deepor Beel not excluded. Researchers can gather and examine data on species variety and abundance using automatic identification software, sound sensors, and camera traps [11]. Data analytics enable the analysis of trends in biodiversity which helps in the formulation of strategies for conservation to save native species and manage invasive species. Furthermore, it can help identify areas requiring intervention for habitat restoration efforts and ultimately improve ecosystem resilience.

Community Engagement through Digital Platforms

Social media and mobile apps can greatly increase community involvement and participation in Deepor Beel conservation initiatives. These digital platforms can be used to collect local knowledge about environmental changes, support citizen science projects, and increase awareness of the ecological significance of wetland areas. To promote a sense of community ownership and responsibility, locals can use smartphone apps to report pollution issues, record wildlife sightings, and exchange information about invasive species [12]. By involving the community via these digital platforms, locals are empowered and data collecting and monitoring for conservation activities are improved.

Hydrological Modeling and Flood Management

In order to evaluate flood hazards and simulate water flow in Deepor Beel, digital hydrological models can be used. This will help decision-makers in effective role play of managing the water resources. These models can be used to forecast how different situations, such as shifting land uses or differences in the climate, will affect flood frequency and water levels [6]. Stakeholders can limit the danger to nearby populations and ecosystems by implementing efficient flood control measures and optimizing groundwater recharge by incorporating real-time data from monitoring systems. Deepor Beel can attain more resilience towards the effects of climate change and sustainable use of water resources by utilizing such predictive capacities.

CHALLENGES IN ADOPTING DIGITAL TECHNOLOGY

Digital technology has a lot of potential to improve conservation efforts in Deepor Beel, but it is not aloof from constraints for effective implementation. It is imperative to tackle these hurdles in order to successfully integrate digital technologies with conservation strategies.

Technological Infrastructure GAPS

There are gaps in the technological infrastructure currently used which pose as obstacles to the application of digital technology for conservation of wetlands. Deepor Beel is ingrained with barriers to digital technology, reliable data collection methods, and adequate internet connectivity. Implementation of real-time monitoring systems and efficient data communication is challenging in many remote areas due to sporadic or non-existent internet access [13]. In addition, unreliable power source mars the operational capacity of digital equipment and sensors essential for data collection. The lack of infrastructural deficiencies act as constraints to the optimum application of modern digital technologies in conservation strategies.

Cost and Technical Expertise

Financial encumbrance with regard to acquisition, implementation, and maintenance of state-of-the-art technology solutions crop up as a substantial hindrance. Application of digital technology involves a huge start-up cost not affordable in many rural areas like Deepor Beel, particularly for community centres and local government agencies with limited resources [36]. Moreover, due to the technical skill requirement in operating these systems, the maintenance becomes quite difficult. This is possibly due to the lack of knowledge and expertise required to run the digital equipment efficiently, thereby limiting the capacity of the stakeholders to support collection of data and monitoring initiatives. Constraints in funds and knowledge limits the chances of digital ventures being sustainable.

Stakeholder Engagement and Digital Literacy

Digital technology demands encouragement of digital literacy among stakeholders and local community

for effective utilisation. Even so, there remains hindrances in educating the community about these technologies. Inadequate exposure to digital tools may result in resistance or doubt about their applicability to conservation initiatives. It is imperative to involve local populations and guarantee that they have the requisite competencies to actively engage in data collection, monitoring, and conservation endeavours [15]. Developing accessible and culturally appropriate digital literacy programs can increase community ownership and participation in conservation efforts.

Data Privacy and Governance Issues

Data privacy and governance issues are major aspects in digital data collection and management for conservation purposes. There are concerns about ownership of data, data security, and use of information morally which can make local stakeholders apprehensive[40]. People in the community might not be willing to disclose private information, for instance, if they are not sure how the information is intended to be used or misused. Transparent data governance frameworks targeted towards privacy concerns and assurance of responsible usage of data builds confidence among stakeholders[15]. Procedures enabling transparent data management furthers collaboration among communities, researchers, and governmental organizations which ultimately impacts the long-term viability of conservation efforts.

CONCLUSION

The usage of digital technologies for monitoring and restoration of the unique ecology of Deepor Beel presents a groundbreaking opportunity for formulation of conservation strategies. It is possible to follow trend patterns in biodiversity, efficient management of new challenges, and gain deeper insights into the health of wetland ecosystems by utilizing digital tools such as remote sensing, data analytics, and real-time water quality monitoring. Success of a conservation plan should project the advantages of modern technology and community involvement, while ensuring the involvement of the local populace in the process. Adopting technology-driven strategies requires cooperation between local people, conservationists, and legislators. The long-term success of conservation efforts are amplified with the inclusion of local

community as this creates a sense of accountability and ownership. Digital platforms can encourage citizen science initiatives that reinforce Deepor Beel's resilience by raising awareness and mobilizing resources. Further study and legislative initiatives are necessary to fully utilize digital technology for ecological sustainability of Deepor Beel. These programs ought to prioritize conservation goals while bolstering local economies and establishing Deepor Beel as a regional leader in wetland management and environmental sustainability.

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The Transformative Impact of Technology on Women-Led Homestay Tourism in Assam: Insights from Two Case Studies

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ABSTRACT

The participation of women in entrepreneurial business has been growing rapidly. The success stories of women entrepreneurs can also be linked to the increasing number of homestays being established by the local communities in those areas where the tourist footfall has seen a gradual upscale. In the state of Assam, where tourism related activities are considered as crucial tool for creating job opportunities and sustaining livelihood, homestays have grown in popularity as a form of accommodation. This study examines how homestay tourism can contribute to women's empowerment in Assam. Through a detailed case study of two female homestay operators, the research examines how homestays contribute to their economic independence, decision-making power, and overall social status within the community. The analysis has been done by conducting an in-depth interview with the two homestay operators and also feedback of the guest experiences and the women's approach to hospitality was collected. By examining the successes and challenges of these two women, the research aims to provide valuable insights into the potential of homestay tourism as a tool for women's empowerment in Assam and similar regions. The study has also briefly analysed the role of technology in successful running of a homestay business.

KEYWORDS: *Homestays, Women, Entrepreneurship, Assam.*

INTRODUCTION

The travel industry is witnessing a surge in popularity for homestay tourism, a unique accommodation option that allows travellers to experience local culture firsthand by staying within private homes. The landscape of entrepreneurship is experiencing a significant shift with the rise of women taking the helm of businesses across various sectors. In India, the homestay tourism industry presents a unique opportunity for women's empowerment, particularly in regions rich in cultural heritage and natural beauty like Assam. It offers a distinct travel experience, allowing tourists to immerse themselves in the local culture and traditions by residing within Assamese homes. By becoming homestay entrepreneurs, women gain economic independence and decision-making power, potentially challenging traditional gender roles within their communities. It empowers women by allowing them to transform

their homes into micro-businesses, fostering economic independence and decision-making power.

This study focusses on the entrepreneurial abilities of the women operating homestays in Assam, the challenges they navigate and the empowering impact this venture has had on their lives by taking the illustrations of two female homestay entrepreneurs in urban as well as rural area. Additionally, this study will also explore how their unique perspectives shape the guest experience, potentially fostering a deeper cultural connection for tourists. Through this in-depth analysis, this study aims to contribute valuable knowledge on the potential of homestay tourism as a tool for women's empowerment in Assam and similar regions.

Homestay Tourism: an Overview

Homestay tourism is considered as a form of hospitality where visitors stay in the home of local residents. It offers guests with unique and authentic experience

by allowing them to immerse in the local culture and customs. This approach enables visitors to experience traditional houses and local cultures firsthand, while also encouraging residents to maintain and showcase their cultural practices. (Wang, 2007) [9]. Homestays can be described as private residences where unused rooms are rented out to travelers, offering an authentic and immersive experience of the local lifestyle.

Homestay tourism is a significant strategy for alleviating rural poverty. It encompasses various activities such as trekking, cultural tourism, agro-tourism, health tourism, and eco-tourism (Devkota, 2010) [3]. This form of tourism offers financial incentives to local communities, encouraging them to conserve both their environment and cultural heritage (Laurie, Andolina, & Radcliffe, 2005) [6]. Homestays act as tool for the development of the local community through economic, socio-cultural and environmental parameters (Singh, 2014) [7]. It also provides a platform for the operators and the local people to showcase their agricultural products and local handicrafts.

The concept of homestays has been increasing rapidly in India, with the Ministry of Tourism, Govt. of India classifying homestays in those states and Union Territories where the state government of those states and union territories does not have their own scheme for approval/classification/accreditation of Bed and Breakfast/Homestay Establishments as 'Incredible India Bed & Breakfast Establishments' and 'Incredible India Homestay Establishments' [8]. The govt. has also formulated the 'National Strategy for Promotion of Rural Homestays' which is an initiative towards Aatmanirbhar Bharat. This strategy is expected to exempt rural homestays from licensing and provide various incentives for running rural homestays. The development of homestays is mostly evident in the Indian Himalayan Region like the states of Ladakh, Jammu and Kashmir, Uttarakhand, Himachal Pradesh, Sikkim etc.

The state of Assam, surrounded by hills, major rivers such as Brahmaputra & Barak and its tributaries, thick forest, tea gardens etc boasts of tremendous scope for developing tourism. In a bid to focus on the quality of hospitality for the tourists arriving in the state and to encourage entrepreneurship, the corporation

aims to promote homestays through a scheme called the 'Aamaar Aalohi Rural Homestay Scheme'. The original scheme which was started in the year 2017-18 provided assistance of 70% of the project cost to a maximum of Rs. 8 lakhs for construction of Assam type cottage (type 1). For construction of stilted Assam type cottage (type 2), assistance of 70% of the project cost was provided to a maximum of Rs. 10 lakhs. The revised scheme of 2022-23 entails providing financial assistance to a group/cluster of minimum 10 homestays units formed into a Community Tourism Organization near a tourist spot. The new homestays which will be part of community-based organizations will be eligible for a capital subsidy of 90% of total project cost of which 50% will be released on 60% completion of work and another 50% on full completion of work. Shortlisted applicants will also get a maximum support of Rs. 2.5 lakhs for promotion of their homestays including websites, social media platforms and different tourism promotional events subject to 50% of the total cost in a year. It is mandatory for all the homestay units under the scheme to be registered with ATDC Ltd and each selected individual under this scheme should have certificate of homestay training programme to be conducted by ATDC without which they won't be able to seek assistance under this scheme [2].

Objectives of the Study

The objectives of the study include:

- To understand how women entrepreneurs manage and operate their homestays.
- To identify the challenges faced by women entrepreneurs in the homestay sector of Assam.
- To identify the level of satisfaction of the guests with the quality of services provided by the homestay operators.
- To understand the role of technology in homestay operations.

RESEARCH METHODOLOGY

The research is descriptive in nature. It investigates the empowering potential of homestay tourism for women in Assam, India, through a detailed case study approach focusing on two female homestay operators. Data has been collected through both primary and

secondary sources. Primary sources of data include semi-structured interviews with the select homestay operators and detailed questionnaires provided to the guests who have visited the homestays. The paper is also based on secondary sources of data taken from different websites, articles, newspapers etc.

The authors whose research articles have been referred to is given due acknowledgement in the reference section

Profile of the homestay operators

Details	Name of the Homestays	
	<i>Luna's Solace</i>	<i>Bandana's Homestay</i>
<i>Name of the proprietor/manager</i>	Ms. Sangita Pegu	Mrs. Bandana Saikia Bishaya
<i>Location</i>	Guwahati, Kamrup (M)	Mayong, Morigaon
<i>Year of commencement</i>	2023	2019
<i>Located in (Area)</i>	Urban	Rural
<i>Nature of Property</i>	Self-acquired	Self-acquired
<i>No. of Rooms</i>	3	1
<i>No. of Staffs</i>	Male: 1 Female: 1	Male: 1 Female: 1
<i>Approximate tourist arrival from the year of commencement</i>	12	50
<i>Registered under</i>	National Integrated Database of Hospitality Industry (NIDHI+)	Aamaar Aalohi Rural Homestay Scheme & Assam State Rural Livelihood Mission (ASRLM)

Source: The table has been compiled by the researcher based on the primary data collected

HOMESTAYS: A PLATFORM FOR EMPOWERING WOMEN ENTREPRENEURS

Homestays have emerged as exemplary models of sustainable tourism, often providing richer experiences than conventional tourist options (Bansal, Shukla, & Tripathi, 2024) [1]. In rural communities of developing countries, where issues like powerlessness, injustice, disparity, and exclusion are prevalent, women and minorities frequently bear the brunt of these challenges. To address these issues, promoting interaction between these communities and the broader world through tourism is a promising strategy. Modern tourists are increasingly drawn to unique cultural and lifestyle experiences in rural settings, which can serve as a catalyst for positive change (George, Mair, & Reid, 2009) [4]. Consequently, involving women, minorities, and local residents in community-based tourism enterprises is crucial for fostering economic, environmental, and social development (Harris, Wise, Gallagher, & Goodwin, 2001) [5].

The interviews conducted with the women homestay operators indicated that the establishment of homestays has a positive economic impact on the local community as it provides employment opportunities for the locals. The rising preference for homestays amongst the tourists has also increased the income of the operators. The tourists from outside the state are also inclined towards buying local products which has led to the growth of small-scale businesses. The homestays are also preserving traditional culture and heritage, thereby facilitating cross-cultural understanding. They have also agreed to the fact that most of the homestay operators of Assam are women.

Both the homestay operators have not faced any major challenge regarding the management of workforce in the homestay such as absenteeism from work, fixation of salary and conflict amongst the staff. One of the most major challenges faced is the arrangement of capital for the establishment of the units. The infrastructure around one of the homestays has not been properly developed including the roads leading to the homestays and electricity and water supply. The units registered under Aamaar Aalohi Scheme and Assam State Rural Livelihood Mission (ASRLM) did not have to go

through much paperwork while the units registered under NIDHI+ faced a lot of complications while registering themselves. There is also lack of fund for marketing and promotion of their homestays, as a result of which they face competition from nearby hotels and resorts.

The majority of the tourists visiting both the homestays were satisfied with the tangibility segment of the homestays which included spacious rooms and neat and clean bathroom. 40% of the respondents suggested that the rooms could have a proper balcony which will offer a scenic and panoramic view of the surroundings. The tourists have also opined that the homestays offer services as expected by the tourists and follow reasonable pricing policy. 80% of the tourists have opined that the host maintains a cordial relationship with the guests and the behaviour of the staff is courteous and friendly. Tourists expressed high satisfaction with the warm and hospitable behaviour of the local residents. They also appreciated that the hosts were attentive to their specific needs, often offering curated sightseeing packages or tailored programs.

ROLE OF TECHNOLOGY IN HOMESTAY OPERATIONS

Online Marketing and Visibility

- **Social media:** The operators utilize platforms like Instagram and Facebook to showcase their homestays, share guest testimonials, and highlight local culture and cuisine. This boosts visibility and attracts a diverse clientele.
- **Travel Websites:** Listing on platforms like Airbnb and Booking.com enables these women to reach a global audience, overcoming geographical limitations.

Booking and Payment Systems

- **Digital Payment Solutions:** Adoption of mobile wallets and online payment systems simplifies transactions, making it easier for guests to book stays without cash dependency.
- **Booking Management Software:** Utilizing software helps streamline bookings, track occupancy rates, and manage schedules efficiently, allowing the operators to focus on enhancing guest experiences.

Communication and Guest Engagement

- **Messaging Apps:** Direct communication through WhatsApp or other messaging apps facilitates quick responses to guest inquiries, fostering a personal touch that enhances customer satisfaction.
- **Virtual Tours:** Offering virtual tours of the homestay and surrounding attractions through video conferencing platforms helps potential guests feel more connected and informed before making a decision.

Skill Development and Training

- **Online Courses:** The operators can access online training programs on hospitality management, marketing strategies, and digital skills, empowering them with knowledge to improve their business acumen.
- **Networking:** Joining online forums and groups for women entrepreneurs in tourism provides valuable networking opportunities, knowledge sharing, and collaboration.

IMPACT ON EMPOWERMENT

Economic Independence: Technology facilitates financial transactions and market access, enabling the operators to generate income and gain financial independence, which positively impacts their families and communities.

Skill Enhancement: Engaging with technology helps the operators develop new skills, from digital marketing to hospitality management, boosting their confidence and career prospects.

Community Development: Increased tourism creates job opportunities in the local community, encouraging other women to engage in entrepreneurial activities, thus fostering a supportive network of female operators.

Cultural Preservation: Technology allows for the promotion of local culture and traditions through storytelling, helping to preserve and share Assamese heritage with a wider audience.

CONCLUSION

This study explored the empowering potential of homestay tourism for women in Assam through

the detailed case studies of two female homestay operators. The findings highlight how homestays can contribute to women's economic independence, decision-making power, and overall social status within their communities. The research also identified challenges faced by these women entrepreneurs. These included navigating cultural norms, balancing work with family responsibilities, and overcoming limited access to resources and training opportunities. Despite these challenges, the case studies demonstrate the transformative potential of homestay tourism for women in Assam. By providing targeted support systems such as training programs, microfinance options, and marketing assistance, policymakers and NGOs can further empower women entrepreneurs in this sector. Besides, the integration of technology in homestay tourism not only enhances the operational efficiency of female entrepreneurs in Assam but also plays a pivotal role in their empowerment. By leveraging digital tools, these women are breaking barriers, creating economic opportunities, and inspiring others in their communities.

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Study on Assam's Handloom Industry: Current Landscape, Technological Adoption and Government Initiatives

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ABSTRACT

India has a long history of weaving, having been a center for the craft since many years. The handloom industry is considered as one of the most significant industries in the country which offers tremendous job prospects to people living in rural and semi-rural areas. This study employs a comprehensive approach, incorporating with secondary data to analyze and synthesize existing information, providing a nuanced understanding of the topic. The paper undertakes an analysis of the current landscape of the handloom industry over time. Within the scope of this paper, an exploration of government initiatives in Assam's handloom sector is also undertaken, analyzing the multifaceted strategies and policies aimed at promoting sustainable development and preserving cultural heritage. The study states that the adoption of modern weaving technologies, such as dobby or jacquard looms, remains limited, with Assam significantly lagging behind in comparison to the rest of India. Barriers such as inadequate access to credit, lack of training, and limited market linkages continue to hinder technological progress, posing a challenge to the industry's modernization and competitive edge.

KEYWORDS: *Current landscape, Cultural heritage, Government initiatives, Handloom, Sustainable development, Weaving.*

INTRODUCTION

India possesses a wealth of historical records pertaining to handloom weaving, which can be traced back to the time of the Indus Valley Civilization. Majority of handlooms in India are located in the households of weavers (95.6%), indicating that weaving on handlooms is essentially a household activity. In India, approximately 31.45 lakh families are involved in handloom production, including weaving and related allied activities which exceeds the total of 27.83 lakh from the Third Census. [1]

Assam holds a significant share in the production of Mekhla Chadder and muffler, accounting for an impressive 77.40% of the overall production in this segment.

LITERATURE REVIEW

A study by Bortamuly et al. examined the factors

influencing workers' occupational choices in the Assamese handloom sector and identified the key variables that impact these decisions.[2]

In the Northeast, women dominate the weaving industry; however, in states like Uttar Pradesh, Andhra Pradesh, Tamil Nadu, Odisha, West Bengal, Haryana, and Karnataka, women primarily engage in pre-weaving tasks, while men are predominantly involved in the weaving process.[3]

A study was conducted on the marketing challenges faced by micro artisan enterprises in the Thenzawl Handloom cluster, Mizoram. The study also reveals that the 'puan' is the most commonly worn ethnic attire in Mizoram. [4]

Hazarika and Goswami analyze the factors influencing tribal women from two major tribes in Assam, Bodo and Mising, in owning handloom micro enterprises.[5]

Another study was conducted to assess the impact of the handloom industry on the development of the people of Assam. The study highlights that Assam's handloom sector is primarily focused on silk, producing four varieties of natural silk: eri, muga, mulberry, and tussar. [6]

METHODOLOGY

This study adopts a descriptive research design to analyze and interpret data obtained from multiple government websites and secondary sources. The area of the study includes handloom industry of Assam. Secondary data have been collected through various reputed journals; books and publications; government websites like the Ministry of Textiles, Government of Assam; Ministry of Development of North-Eastern Region (DoNER) etc and research reports like 4th All India Handloom Census, Economic Survey, Assam, Market research report for India Handloom brand promotion etc.

Adoption of Modern Weaving Technology in the Handloom Sector

In India, adopting modern weaving technology in the handloom sector is crucial for maintaining income and employment for millions, especially in rural areas. However, the sector continues to face challenges due to technological stagnation. [7] [8]. Despite government efforts such as the Technology Upgradation Fund Scheme (TUFS) introduced in 1999 to improve the competitiveness and productivity of textile units, the modernization of handloom operations has progressed at a very slow pace. [9]. By 2010, only 19% of the 2.38 million looms in the country were upgraded with advanced machines like dobby or jacquard looms, leaving the majority of the industry dependent on outdated techniques. [10]

In Assam, the situation is even more challenging. The use of modern looms like pit looms is significantly lower, with only 0.34% of looms being of this type compared to 74% in the rest of India [11]. This indicates that the state's weaving sector lags behind in adopting modern technology, relying heavily on traditional looms and techniques. Barriers such as inadequate access to credit, lack of market linkages, insufficient training, and limited awareness about modern technologies continue to hinder the widespread adoption of advanced equipment.

This makes it challenging for Assam's handloom industry to compete with the more advanced mill and power loom sectors. [12]. Factors such as restricted access to capital, inadequacy of market exposure, and also cultural resistance to new technologies play a key role in the poor adoption of weaving technology in Assam [13][14]. Addressing these barriers is essential for boosting the competitiveness of Assam's handloom sector and ensuring its growth and sustainability in the broader textile industry. [12]

Data Collection

Objective 1: Current landscape/status of Handloom Industry in Assam

There are 312.05 lakh people living in Assam, with 159.39 lakh men and 152.66 lakh women [15].

Table 1 Overview of Assam Handloom (As per Fourth National Handloom Census, 2019-20)

Sl. No	Particulars	Units in No.
1	Handloom Households	12.69 lakh
2	Handloom Weavers	12.83 lakh
3	Number of Handlooms	12.46 lakh
4	Number of Part-time weavers	8.88 lakh
5	Number of Full-time weavers	2.19 lakh
6	Number of Female weavers	11.79 lakh
7	Number of Male weavers	1.04 lakh
8	Average annual working days of weavers	171 days
9	Weavers producing Gamocha	3.55 lakh
10	Weavers producing Mekhela-chadar	6.16 lakh
11	Weavers producing furnishing clothes	0.27 lakh
12	Weavers producing dress materials	0.22 lakh
13	Weavers producing other fabrics	2.47 lakh
14	Weavers using Muga silk yarn	54,508
15	Weavers using Eri silk yarn	43,685
16	Weavers using Mulberry silk yarn	5,401
17	Weavers owning one or more nos. of looms	10.20 lakh
18	Weavers without looms	76,981

Source: Government of Assam, Directorate of Handloom and Textiles

The table provides a detailed insight into the handloom industry in Assam, showcasing its current magnitude and

dynamics. With 12.69 lakh handloom households and 12.83 lakh weavers, Assam stands out as a significant center for handloom production. The distribution between part-time and full-time weavers, with 8.88 lakh and 2.19 lakh respectively, emphasize the diverse employment patterns within the state's handloom sector. Moreover, the dominance of female weavers, comprising 11.79 lakh of the total workforce, highlights the crucial role played by women in sustaining the industry. Overall, the data portrays Assam as a vibrant center for handloom weaving, characterized by its scale, diversity, and community-driven initiatives.

Assam handloom goods are mostly sold on the local market, with a small proportion also being exported both abroad and to other parts of India. Muga is highly demanded in Japan, where it is used to make the traditional "Kimanu" garment. The primary textiles exported are plain muga fabrics and Muga and Mulberry silk "saree" designs.[2]. Demand for Golden Silk Muga and Silk Eri is high in the Middle East, South Africa, Japan, and Europe, among other places. [8]. The budgetary provisions allocated to the Ministry of Textiles of India, during the fiscal year 2022-23, revealed a revenue allocation of Rs. 12,357.11 crore and a capital allocation of Rs. 25.032 crore. [15]

Table 2 The percentage of raw materials used on average to produce handloom fabric in Assam

Estimated Usage Percentage	
Muga Silk	6.27
Eri Silk	12.20
Mulberry Silk	7.33
Cotton	53.00
Wool	5.07
Acrylic	9.20
Polyester	4.87
Others	2.07

Source: Handloom Policy of Assam, 2017-18 [8]

Although Assam generates 80% and 64% of the nation's Eri silk and muga, respectively, only around 12.20% and 6.27% of Eri Silk and Muga are consumed as raw materials. As a result, the state exports the majority of its raw Muga and Eri production.

Here are some summarized findings related to the current landscape of the handloom sector in Assam:

- Assam is home to approximately 12.69 lakh handloom households and 12.83 lakh weavers, highlighting its significant presence in the handloom industry.
- The distribution shows that there are 2.19 lakh full-time and 8.88 lakh part-time weavers, with female weavers making up the majority at 11.79 lakh, highlighting the significant role that women play in the industry.
- Assam's handloom industry produces four types of natural silk: Muga, Mulberry, Eri, and Tussar. Among them, Muga and Eri silk are especially prized for their unique qualities.
- Assamese handloom products have both domestic and international markets, with high demand for Muga silk in countries like Japan and Europe, where it is used for traditional garments.
- Raw material consumption for handloom fabric production in Assam reveals a significant reliance on cotton (53%) alongside silk varieties and other materials, reflecting the diversity in raw material usage.

Objective 2: Government Initiatives in Assam's Handloom Sector

After splitting from the original department of Sericulture and Weaving in 1983, the Directorate of Handloom Textiles was established, and it has since worked to strengthen the industry both qualitatively and quantitatively.

In order to allow weavers to weave clothing on their looms at home, the Weavers Extension Service Unit scheme has been launched. Yarns from these Units are delivered to the weavers, and when needed, the technical personnel at these centers provides technical help. Across the state, there are 98 Weavers Extension Service Units in operation.

The Department of Handloom & Textiles operates 102 Handloom Training Centres, mostly in rural areas of the state, to provide training for aspiring craftsmen and to advance their knowledge in handloom weaving,

designing, and dying, among other skills. Under this plan, every student who successfully completes his studies is eligible to get a single loom-oriented package worth Rs. 25,000.

In order to enable genuine weavers to sell their goods at competitive prices, the government has decided to establish Yarn Banks in every district headquarters and other significant handloom cluster in the state. These banks will provide high-quality yarns to authentic weavers at a revised subsidized rate of 30%.

The Assam government has launched the "Assam Agri-Business and Rural Transformation Project (APART)" in the handloom sector across five districts of the state which is supported by the World Bank, and thus focuses on advancing the handloom industry.

In order to develop skilled technical individuals in the field of handloom who can then instruct weavers in weaving, designing, dyeing, processing, and other related activities the department has established four (four) Handloom Training Institutes. With a monthly stipend of just Rs. 250/-per trainee, these 4 (four) institutes can accommodate a total of 97 trainees.

To introduce innovations in all three aspects of handloom weaving—designing, weaving, and dyeing and processing—the Directorate of Handloom & Textiles operates the Handloom Research and Designing Centre (HRDC).

The Assam government's Ministry of Textiles has initiated a campaign to promote the "Silk Mark," an official symbol for goods made of silk that serves as a distinguishing factor between genuine and imitation silk.

To differentiate genuine silk from imitation silk, the Assam government's Ministry of Textiles has introduced the "Silk Mark" campaign. This official symbol certifies products made of authentic silk, similar to how the "Hallmark" represents precious metals and the "Woolmark" identifies woolen goods. [2]

Weavers in financial distress can apply for loans at a minimal interest rate of 6% to 7% under the Weavers MUDRA Loan Scheme, a credit facility. The Ministry of Textiles provides financial support for margin money, interest subsidies, and credit guarantee fees for

loans authorized under the weavers' "Mudra Scheme." Furthermore, 20% of the loan amount up to Rs. 10,000.00, or Rs. 10,000.00, is the maximum margin money allowed under the scheme.

The "STATE HANDLOOM POLICY, ASSAM 2017" was approved by the Assam government in order to provide working capital subsidies, revolving credit systems, raw material subsidies, logistical support, and other forms of comprehensive and all-encompassing assistance to the state's handloom weavers, entrepreneurs, and sericulture farmers, as well as investors in the industry.

The "TEXTILES & APPAREL POLICY, ASSAM 2018" was created by the Assam government with the goal of creating new small and medium-sized enterprises in the state and expanding opportunities in the textile industry.

CONCLUSION

In conclusion, the handloom sector in Assam stands as a vital component of the state's cultural and economic fabric, home to approximately 12.69 lakh handloom households and 12.83 lakh weavers, with women playing a substantial role. Specializing in traditional fabrics like Gamocha and Mekhela-chadar, and renowned for its production of natural silks such as Eri, Muga, Mulberry, and Tussar, Assam's handloom industry not only preserves its rich heritage but also caters to both domestic and international markets. Further support through the establishment of Handloom Training Centres, Yarn Banks, and financial assistance schemes underscores the comprehensive approach taken to enhance skills, infrastructure, and earnings. The adoption of policies like the "STATE HANDLOOM POLICY, ASSAM 2017" and the "TEXTILES & APPAREL POLICY, ASSAM 2018" highlights the commitment to sustaining and growing the handloom and textile sectors, ensuring a prosperous future for Assam's weavers. The research has shed light on the economic perspective of weavers in Assam, highlighting both the present challenges and future prospects.

CONTRIBUTION

Despite a concentration of income in lower brackets among handloom households, the sector fosters socio-economic empowerment. The government has been instrumental in supporting the handloom industry

through initiatives such as the Directorate of Handloom Textiles, the Weavers Extension Service Unit scheme, and the Handloom Cluster Development Programme. Furthermore, programs like the Assam Agri-Business and Rural Transformation Project (APART) are designed to promote Muga and Eri silk on a global scale. In addition to this, while government initiatives like the TUFs have aimed to modernize India's handloom sector, Assam's weaving industry continues to face significant challenges in adopting advanced technology.

FUTURE RESEARCH

While there are hurdles to overcome, the progress and resilience demonstrated by the handloom industry in Assam, supported by government initiatives, underscore its potential for sustainable development and socio-economic empowerment. By fostering a favorable environment for innovation, entrepreneurship, and skill enhancement, Assam's handloom sector can continue to flourish, contributing to the state's economic growth and cultural vibrancy for years to come.

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Financial Performance Evaluation of Selected Automobile Companies

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ABSTRACT

The Indian automobile industry plays a significant role in the nation's economy, which is marked by vibrant expansion, technological advancements, and evolving consumer choices. Within this scenario, assessing financial performance emerges as a key goal that gives a holistic view of automobile companies' effectiveness, profitability, and strategic standing. This research seeks to evaluate the financial performance of Indian automobile companies through ratio analysis, which provides a comprehensive assessment of key financial indicators. Using secondary data, the study examines the financial performance of selected companies across four distinct parameters: organizational profitability, liquidity, management efficiency (activity), and financial leverage (long-term solvency). The research categorizes companies based on their performance and offers recommendations for improving the industry. Overall, it establishes a framework for assessing the financial performance of Indian automotive companies and lays the foundation for future research and analysis in this significant area of study.

KEYWORDS: *Automobile industry, Ratio analysis, Leverage, Liquidity, Managerial efficiency, Profitability.*

INTRODUCTION

Throughout history, the Indian automobile industry has been a reliable gauge of economic advancement due to its significant contributions to overall economic growth and technological advancement. The two-wheeler segment predominantly controls the market due to the increasing middle class and a significant portion of the Indian population being young. The paper analyses the financial performance of selected automobile companies for five years from 2019 to 2024. This study aims to comprehensively analyze the financial situation and strategic position of these companies in the competitive environment by looking at important financial and performance indicators. Based on past performance of companies, assignment of ranking also has been done.

LITERATURE REVIEW

1) Peruri Praveen Kumar (2024) [1] conducted a

comparative study on Tata Motors, Ashok Leyland, Olectra Greentech, Force Motors, and SML Isuzu. The objective was to use fundamental research to assist investors in making wise financial decisions while making stock market investments. When evaluating the inherent values of Olectra Greentec, Force Motors, and SML Isuzu, the analysis concludes that they are undervalued..

2) Kanagavalli, G., & Devi, R. S. (2018) [2] conducted research on performance of selected automobile companies. The paper used ratio analysis to measure the financial performance of selected automobile companies for five years from 2013-2017.. The study aimed to compare the risks of various organizations and evaluate their advantages and disadvantages. The study discovered a significant positive correlation between the liquidity ratio.

3) Dr. Nishi Sharma (2011) [3] researched "Financial Analysis of the Indian automobile industry." The paper

analyzed the financial performance of seven monarch companies of the four-wheel segment of the automobile industry for ten years from 2001-02 to 2010-11.

Eleven financial indicators, which stand for four distinct parameters—profitability, liquidity, managerial efficiency (activity), and leverage were used to analyze the financial performance of the chosen units.. It also recommended some actions for the industry's further improvement and ranked various businesses according to their performance [4].

OBJECTIVES OF THE STUDY

1. To evaluate the overall financial health of selected Indian automobile companies by examining key financial metrics, including profitability, liquidity, solvency, and efficiency ratios.
2. To compare and rank the selected companies based on their average financial performance over the past five years, from April 2019 to March 2024.

RESEARCH METHODOLOGY

Sources of Data

The data were obtained from the company's annual reports and websites.

Period of Study

The study covers five years, from April 2019 to March 2024.

Sample Size

Five automobile companies chosen for the study are:

1. Tata Motors Ltd
2. Maruti Suzuki India Ltd
3. Eicher Motors Ltd
4. Hero MotoCorp Ltd
5. Bajaj Auto Ltd

Limitations of the study

The research relies on existing data and is subject to the accuracy of the available data.

These recommendations and conclusions are specifically tailored to these particular companies and may not be universally applicable to all industries. Additionally, the

study is constrained by the size of the sample and the duration of the research period.

Findings: Comparison of Selected Automobile Companies :

Profitability Analysis

A company's profitability assesses its effectiveness in utilizing resources to generate profits.

Table 1: Profitability Ratio Analysis [5]

Arithmetic Mean for the period April 2019 to March 2024

	Maruti Suzuki	Bajaj Auto	Hero Moto Corp	Eicher Motors	Tata Motors
Basic EPS (Rs.)	232.502	209.3	154.432	206.58	-2.702
PBDIT Margin (%)	12.28	21.57	15	28.274	11.496
Net Profit Margin (%)	6.736	16.268	9.794	17.97	-1.132
Return on Net Worth/Equity (%)	11.176	21.948	19.362	16.992	-5.37
Return on Assets (%)	8.33	17.7	13.494	13.344	-0.388

Maruti Suzuki has the highest Basic EPS at Rs. 232.502, indicating strong profitability per share. Bajaj Auto follows closely with Rs. 209.300.

Eicher Motors leads with the highest PBDIT Margin and Net profit Margin, indicating strong profitability from its core operations.

Bajaj Auto has the highest Return on Net Worth/Equity at 21.948%, indicating efficient utilization of shareholder funds to generate profits. Maruti Suzuki has a respectable return on equity, although slightly lower than Bajaj Auto and Eicher Motors. Tata Motors,

however, has a negative return on equity, indicating that it's not generating profits from shareholders' equity.

Bajaj Auto has the highest Return on Assets at 17.700%, indicating efficient utilization of assets to generate profits. Overall, Bajaj Auto and Eicher Motors seem to be performing the best across most of the metrics provided, indicating strong profitability and efficient management of resources. Maruti Suzuki and Hero MotoCorp also exhibit healthy financial performance, while Tata Motors appears to be facing challenges, especially with negative figures in Basic EPS, Return on Equity, and Return on Assets.

LIQUIDITY ANALYSIS

The liquidity ratio shows how well a company can cover its short-term financial obligations.. This is typically done by calculating the current ratio and the quick (or liquid) ratio.

Table 2: Liquidity Ratio Analysis

Arithmetic Mean for the period April 2019 to March 2024 [5]

	Maruti Suzuki	Bajaj Auto	Hero Moto Corp	Eicher Motors	Tata Motors
Current Ratio (X)	0.868	1.882	1.744	2.134	0.942
Quick Ratio (X)	0.646	1.63	1.466	1.778	0.684

Eicher Motors has the highest current ratio at 2.134, indicating that it has more than twice its current assets compared to its current liabilities, reflecting a strong ability to meet short-term liabilities. Bajaj Auto follows with a current ratio of 1.882, indicating a healthy liquidity position..

Eicher Motors again leads with the highest quick ratio at 1.778, indicating a strong ability to cover short-term liabilities . Bajaj Auto follows closely with a quick ratio of 1.630, suggesting a healthy liquidity position even when excluding inventories.

Overall, Eicher Motors and Bajaj Auto appear to have the strongest liquidity positions based on the current

and quick ratios. Hero MotoCorp also shows good liquidity, while Maruti Suzuki and Tata Motors seem to have relatively weaker liquidity positions, especially when considering their quick ratios, which exclude inventories.

MANAGERIAL EFFICIENCY ANALYSIS

Table 3: Managerial Efficiency Ratio Analysis

Arithmetic Mean for the period April 2019 to March 2024 [5]

	Maruti Suzuki	Bajaj Auto	Hero Moto Corp	Eicher Motor	Tata Motor
Asset Turnover Ratio (%)	44.35	39.74	57.41	27.15	16.6
Inventory Turnover Ratio (X)	17.41	19.85	17	9.32	3.46

Hero MotoCorp has the highest asset turnover ratio at 57.406%, which generates significant revenue relative to its total assets. This suggests efficient asset utilization in generating sales. Maruti Suzuki follows closely with an asset turnover ratio of 44.352%, which indicates effective use of assets to generate sales.

Bajaj Auto has the highest inventory turnover ratio at 19.850 times, indicating that it efficiently manages its inventory by quickly selling and replacing it. Maruti Suzuki and Hero MotoCorp also show strong inventory turnover ratios, indicating efficient inventory management and a high turnover rate.

LEVERAGE (LONG-TERM SOLVENCY) ANALYSIS

This study evaluates the leverage of selected companies by examining the debt-equity ratio and the interest coverage ratio.

Table 4: Solvency Ratio Analysis

Arithmetic Mean for the period April 2019 to March 2024 [5]

	Maruti Suzuki	Bajaj Auto	Hero Moto	Eicher Motors	Tata Motors
Total Debt/Equity (X)	0.01	0.01	0.02	0.01	2.14
Interest Coverage Ratios (%)	70.14	805.2	74.11	9.32	3.47

Debt equity ratio indicates the proportion of equity and debt in total financing of the concern. Maruti Suzuki has the lowest Total Debt/Equity ratio at 0.008, showcasing a highly conservative capital structure with minimal dependence on debt financing. Bajaj Auto and Eicher Motors also have low Total Debt/Equity ratios, suggesting conservative financing structures. Bajaj Auto has an exceptionally high-interest Coverage ratio of 805.192%. Maruti Suzuki and Hero MotoCorp also have relatively high-interest Coverage ratios, indicating comfortable levels of coverage for their interest obligations.

RANKING OF THE COMPANIES

This part ranks various companies based on their average performance for specific variables. A company with the highest average performance in a particular variable is ranked 1, while a company with the lowest ratio ranks 5. Yet, when looking at the long-term debt-to-equity ratio, creditors prefer a lower ratio, leading to a reversed methodology. Once all variables have been ranked, composite scores are calculated for each parameter, and ranks are reassigned for each parameter. The parameter with the lowest composite score is ranked first, while the parameter with the highest score is ranked last.

Table 5: Ranking of Selected Companies based on their Average Performance [5]

	Maruti Suzuki	Bajaj Auto	Hero MotoCorp	Eicher Motors	Tata Motors
Basic EPS (Rs.)	1	2	4	3	5
PBDIT Margin (%)	4	2	3	1	5
Net Profit Margin (%)	4	2	3	1	5
Return on Net worth/ Equity (%)	4	1	2	3	5
Return on Assets (%)	4	1	2	3	5
Composite score	17	8	14	11	25
Rank based on profitability	IV	I	III	II	V
Current Ratio (X)	5	2	3	1	4
Quick Ratio (X)	5	2	3	1	4
Composite score	10	4	6	2	8
Rank based on Liquidity	V	II	III	I	IV
Asset Turnover Ratio (%)	2	3	1	4	5
Inventory Turnover Ratio (X)	2	1	3	4	5
Composite score	4	4	4	8	10
Rank based on efficiency	I	I	I	II	III
Total Debt/ Equity (X)	1	3	4	2	5
Interest Coverage Ratios (%)	3	1	2	4	5
Composite score	4	4	6	6	10
Rank based on solvency	I	I	II	II	III

CONCLUSION

Bajaj Auto consistently performs well in profitability, liquidity, efficiency, and solvency, making it the best overall performer.

Maruti Suzuki Shows strong efficiency and solvency but needs improvement in profitability and liquidity.

Hero MotoCorp Maintains a balanced performance, with strengths in efficiency and moderate standings in other areas.

Eicher Motors Excels in liquidity and shows reasonable performance in other metrics, indicating good short-term financial health.

Tata Motors Despite high profitability, it lags significantly in liquidity, efficiency, and solvency, making it the least favorable in this analysis.

Overall, investors and stakeholders should consider Bajaj Auto to be the most balanced and robust company based on the analyzed metrics. Maruti Suzuki and Eicher Motors also show strengths but have areas needing improvement. Hero MotoCorp is consistent but not exceptional, while Tata Motors, despite high profitability, faces challenges in other critical financial aspects.

RECOMMENDATIONS

Bajaj Auto: Maintain current strategies driving profitability and efficiency; explore expansion and innovation to sustain leadership.

Maruti Suzuki: Optimize cost structures and explore new revenue streams to improve profitability and liquidity.

Hero MotoCorp: Focus on high-margin products and operational efficiency; reduce debt to strengthen solvency.

Eicher Motors: Use strong liquidity to invest in efficiency improvements and focus on debt reduction for long-term stability.

Tata Motors: Improve liquidity with better cash flow management, streamline operations, and reduce debt to strengthen solvency.

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Leveraging Blockchain Technology for Sustainable Tourism Development: Opportunities and Challenges

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ABSTRACT

Over time, blockchain technology has become a potential panacea to alleviate some of the challenges ailing the tourism industry, especially regarding sustenance and responsible practices. With sustainability in focus, this study contends that it is imaginable for sustainable tourism to be promoted through blockchain technology. As a result, this article seeks to establish if the employment of blockchain technology in enhancing sustainability in tourism by scrutinizing several practical situations and readings may improve clarity, reliance, and productivity in the tourism economic matrix. We will evaluate possible uses of blockchain for enhancing smart contracts for safe and decentralized bookings or managing supply chains where goods and services can be traced easily.

KEYWORDS: *Blockchain, Era, Sustainable, Tourism, Enterprise.*

INTRODUCTION

Blockchain can be described as a decentralized, allotted ledger generation wherein transactions may be securely recorded over a network of computers, in the long run eliminating the want to depend on 0.33 events like banks or governments for transaction authentication or protection purposes. Rather than depending on a central body like a bank to confirm these transactions, blockchain leverages the power of many computer nodes (usually known as miners) that together validate and record transactions in what is known as blocks. Here are some of the key principles that you should know about blockchain technology:

Listed here are several core ideas you should be familiar with:

1. **Decentralization:** Unlike usual centralized regimes, which imply that a specific body oversees all information, blockchain is based on a distributed network of computers. Each separate node possesses the complete blockchain replication, thereby safeguarding it from any single-point failure and making operations apparent.
2. **Immutable Ledger:** once data has been registered in the ledger system, it practically becomes impossible

to change anything about this file anymore; this is how our financial records will be secured and untouchable. It is done using cryptographic methods depending on consensus algorithms such as “Proof of Work (PoW).” or “Proof of Stake (PoS)” This means that any block alteration would necessitate agreement among most network members; therefore, it is hard to change past transactions.

3. **Transparency:** The blockchain is transparent. Every network user can view transactions. However, the identities of those taking part are often false □ Their real names are unknown as cryptographic addresses identify them; nevertheless, it is possible through their transactions to see where money comes from or goes to, ensuring responsibility and confidence.
4. **Smart Contracts:** Self-executing contracts with pre-defined conditions written in code are smart contracts. Such contracts routinely enforce and satisfy their responsibilities once mounted criteria are met. All smart contracts work on blockchains which make feasible a massive number of decentralized packages (DApps) and use cases from decentralized finance (DeFi) to supply chain management.

5. Cryptocurrencies: blockchain technology came into cognizance with the inception of cryptocurrencies like Bitcoin, and Ethereum. These virtual properties work on the blockchain network that permits transactions among peers without the involvement of middlemen such as monetary institutions. Thus, to save you from fraud or other kinds of unauthorized access to transactions, virtual currencies use cryptographic elements of the blockchain (a decentralized ledger system in which transactions are recorded on more than one computer system) to stabilize them even as also regulating the advent of greater foreign money units.
6. Consensus Mechanisms: The Protocol of Consensus is a consensus mechanism. It is used by the nodes of a network to agree on the current state of the ledger. All blockchains have their unique mechanisms like PoW, PoS, and DPoS (“Delegated Proof of Stake”), among others. These methods decide how new blocks should connect to the blockchain and how consensus is reached among people.
4. “BloHosT: Blockchain-Enabled Smart Tourism and Hospitality Management ”: - The study is about a blockchain-based tourism framework for interconnectivity and acceptance as true with stakeholders, a smart contract layer for communication, and a design framework called ‘TeDL: Tourism eDeep-Learning’ for rating destinations based on previous travelers’ itineraries. The study develops Blohost for registration and to execute smart contracts. A TeDL layout framework is facilitated to create a rating system for future global tourists using LSTM on previously stored travel itineraries [4].

LITERATURE REVIEW

1. Blockchain and Tourism: A systematic literature review: - Blockchain technology and tourism, academic research is rigorous in its design and technique, typically utilizing theory and expanding on prior findings. The blockchain’s impact is likely to be far-reaching and comprehensive [1]. A systematic literature review on blockchain technology and tourism is done by various researchers.
2. Adoption of Blockchain Technology in Hospitality: - To make customer data private and to allow people to travel without paper, blockchain must be adopted in the hospitality industry. In the travel industry, the knowledge about the position of technology remains shallow here the authors provide a few things that we need to know that this research paper is exploratory and discusses the prominent work related to the blockchain industry in the hospitality [2].
3. Assessment of Blockchain Applications in the Travel and Tourism Industry: - The governance model, platforms, consensus type, use of cryptography currency, smart contract, and token [3]. Through their paper, they examine the alternative. The outcome of this research is to set the proposed blockchain basics criteria which allows academics and make decisions to evaluate applications The analysis aids in determining the blockchain governance model used, which helps to determine its qualities such as confidentiality, Constancy, proficiency, clarity, and data validity. Second, Scalability, transaction speed, and energy consumption are among the performance metrics that may be influenced by blockchain platform choices.
5. Blockchain Tourism Apps: existing Cases of Value System:- The paper’s objective is to examine the applicability of blockchain and identify its potential benefits, through a content analysis of 175 news articles using GABEK® methodology where the research led to the conceptually identifies the limitations and guidelines that’s a subject of debate and also simplified transportation via the transformation which provides delivered fee for passengers.
6. Trust in Tourism via Blockchain Technology: - The paper explores the potential of Business Content Technology (BCT) in hospitality operations management with a focus on marketing transparency, sharing economy applications, and improving host-guest relationships [5]. However, challenges such as industry confusion and regulatory immaturity hinder its future application.

Future studies should investigate BCT's role in the digital economy, smart cities, and smart tourism.

7. Sustainable Supply Chain, Digital Transformation, and Blockchain Technology Adoption in the Tourism Sector: - The research seeks to study the effect of a sustainable delivery chain strategy on sustainable aggressive benefit by thinking about the mediating role of blockchain generation implementation and the Regulatory function of Digital Transformation (DT) and sustainable deliver chain practices. The studies investigate sustainable supply chain management (SCM) and era adoption in the tourism sector. It specializes in the connection among supply chain sustainability (SSCS), generation adoption (DT), blockchain adoption, sustainable delivery chain practices (SC), and delivery chain duty (SCA). The studies unearth the importance of sustainable tourism practices [6].

Opportunities

1. Transparent: A transaction's blockchain is an infallible history of the tourism company's full-scale pursuit of sustainable tourism, thus customers can double-check whether the hotels they stay in are indeed green, tour operators that are responsible and fair-trade certified are offering souvenirs of the same origin.
2. Supply Chain Management: Blockchain technologies will make it possible to track production, logistics, and all services from their inception to their delivery, as a result, suppliers will get to know how eco-friendly ways of production can be cultivated; from the point of sourcing a material, through the proper waste management.
3. Smart Contracts: Theoretically, smart contracts eliminate intermediaries, mediation costs, and unnecessary time delays, thus ensuring the safety of every participant by automating the process.
4. Tokenization: Blockchain tokens not only incite tourists and communities to work together in making the environment more sustainable through incentives from different eco-friendly and carbon-offset suppliers, and local community funding but also enable the use of energy certificates to reward users through digital tokens. (For instance, the

Electronics Recycling Certification, The Council of the Better Business Bureau, and Green Tags are among the many initiatives that have incorporated energy credits through blockchain tokenization to this end)

5. Decentralization: But, when the concept of blockchain is to be decentralized, we could think that property rights would be transferred completely to the local people who will not be confined only to tourism, and also the potential negative effects, many of them severe, could be minimized because the negative effects usually come out of mass tourism such as over or cultural exploitation of the locals.

Problems

1. Adoption and Awareness: The potential benefits of blockchain technology may be unknown to many players in the tourism industry. Delayed adoption is partly because of the need for awareness, infrastructure, and regulation clarification.
2. Scalability: Blockchain scaling is currently a problem for blockchains that are blockchains mainly used for the travel sector in which transaction volumes are sometimes increased during seasons of tourism due to the higher amount of traffic data.
3. Privacy and Security: It is indisputable that blockchain has further advanced security through encryption and decentralization; however, it has brought serious concerns regarding data privacy, especially with sensitive environmental information and personally identifiable information of tourists.
4. Interoperability: The main issue in this area of work is that it is hard to provide interoperability of blockchain platforms, and heritage systems within a tourism ecosystem. The integration and data exchange between systems can only be realized through the standardization of the method of technology procedures.
5. Energy Consumption: Some networks like Bitcoin that follow the proof-of-work consensus mechanisms have to consume high energy. To this end, the production of blockchain-based environmental solutions must be more sustainable

and eco-friendlier, one of them being the use of proof-of-stake and energy

The complexity of tourism presents difficulties especially in blockchain adoption but through mutual participation from all industry stakeholders, technologists, and local communities, the hurdles relating to this can be addressed. Only this will open the door to blockchain as a cornerstone of the tourism industry linked to fair tourism, climate resiliency, and responsible nature tourism.

Blockchain Implementation in Tourism

There are different categories for potential implementation of Blockchain technology in tourism

Inventory Management

Travel & hospital inventory refers to hotel seats and seats in planes, trains, and buses. Blockchain technology helps collect and share information about availability and comparison to different stakeholders. Blockchain technology eliminates intermediaries and associated costs by connecting products directly to consumers [7]. A further instance is food. 'Smart contracts' can be employed in services as long-term deliverables [8].

Monitoring and Tracking

In aviation, it is important to record aircraft equipment and events and comply with the rules. Regular maintenance. Blockchain can prevent errors in the lifecycle of the data asset, preserve evidence, and ensure compliance with regulatory requirements [9].

Details, reservations and ticketing

If the ticket expires it will be canceled and replaced with a new one [10]. Similarly, managing support requests is a complex process involving many partners.

Baggage tracking

The tracking of travelers' items is a unique example of traceability. Blockchain's openness allows for easy tracking of location and status [11]. It is recommended keeping track of travelers' assets and noting any changes of possession. Tourists may get real-time information on the whereabouts of their luggage and things on their smartphones or tablets. [12].

Smart Contract

The term smart contract is deceptive. These programs are not smart and do not adjust to environmental changes. Instead, their execution is very predictable. To get consistent outcomes among nodes, catalytic conditions must be accurately established ahead of time. These are not legally binding contracts. The automation of the execution of contracts, compliance surveillance, conciliation, invoice generation, and settlement can save effort and time in the tourism industry. [11].

Dapps for Smart Tourism

Dapps are programs that run through a private network, instead of a center control body. Although this chapter cannot cover all conceivable application situations, new opportunities. Dapps aims to create a user-friendly interface while also leveraging blockchain technology.

Loyalty and Personal Marketing Programs

Customers consciously choose services that appeal to them, resulting in most of the points earned not being beneficial [13]. Because it is not clear yet. The use of fair-trade tokens can create a competitive market and provide feedback on the organization's performance. The rewards wallet handles tokens across partners and purchases, enabling instant and seamless transactions, content exchange, smart contracts, and general reporting.

CASE

Case I -The Futuristic City is the nickname given to Dubai. The hot spot for Smart Tourism 2.0 utilizing the SRDTS (Socially Responsive Dynamic Tourist System) framework is known as Dubai [14]. The 'Department of Tourism and Commerce Marketing (DTCM)' of Dubai has unveiled 'Tourism 2.0, which is a blockchain-based travel marketplace that focuses on B2B activities. One of the critical features of this platform is the ability of hotels and tour operators to use blockchain as a means for executing smart contracts and delivering personalized offers to customers using social platform applications. The tourism strategy 2020 of Dubai aims at accommodating 20 million people under the Dubai 10X program. It's an open-source initiative based on blockchain; technology whose aim is transparency in payments and asset monitoring for

users: Arabian Chain technology, is driven by its online community and it enables traceability in payments and assets for users. This makes it possible to perform intelligent contracts around the world, deploying them in a decentralized way.

RESEARCH OBJECTIVES

1. Understanding Blockchain Technology: We are trying to unveil the main concepts, applications and scopes of this technology in Sustainable tourism.
2. Discovering new opportunities: Blockchain technology may have the potential to be used in the tourism sector sustainably, especially in areas where transparency and traceability are vital. This means that we can provide proof of production and transparency to our tourist authorities.
3. Examination of Specific Cases: Search for some existing cases or test examples of different firms where blockchain applications have facilitated electronic tourism activities in order to comprehend the touring's, pros, and cons.
4. Developing Implementation Strategies: Outline specific practical steps and principles for the use of blockchain technology in ecotourism projects, using scalability, interoperability, and cost-effectiveness as the main guidelines for project implementation.
5. Impact and Performance Measurement: Develop key performance indicators (KPIs) and specific measurements to evaluate the introduction of blockchain technology in eco-tourism development by checking carbon footprint, prosperity, and so on.

RESEARCH METHODOLOGY

1. Literature Review: Examine the extent and quality of recent writings on related topics such as blockchain technology, sustainable tourism, etc. This study will be the basis of the theoretical framework.
2. Case Studies: The paper focuses on the survey, which aims to be a source of knowledge about the many possibilities, apprehensions, and best practices in tourism sustainability via blockchain applications.
3. Survey: By drafting and launching a survey to

receive distinctive replies from diverse community members, such as tourists and industry scholars.

4. Data analysis: Processing through qualitative and quantitative data that are obtained from interviews, and case studies, the crux of the matter is mostly the statistical method of analysis, and data are known to have clear patterns, relationships, and trends accordingly.

Analysis

To begin, 16 sub-attributes were found to fall under the umbrella of the 6 primary attributes, which were as follows: Adoption and Awareness, Efficient and Handling, Safety and Security, E-Wallets, Scalability, and Problem & Challenges. These features were derived from a wide range of literature investigations. Inferences were utilized and the final questionnaire was selected from the valid and reliable which was used in the research paper.

Once the questionnaire was developed and finalized, 150 participants were approached to complete it using an online format. The intention of this research changed into to gain insights into Blockchain generation and to explore its key standards, programs, and capacity impact on sustainable tourism. Blockchain generation can be used within the tourism area sustainably, especially in areas where transparency and traceability are vital. This means that we can provide proof of production and transparency to our tourist authorities. The case study about Dubai Tourism 2.0 was searched to understand electronic tourism activities to comprehend the touring, pros, and cons. The various literature reviews and case studies help us to understand blockchain technology scalability, interoperability, and cost-effectiveness. Impact and Performance Measurements were developed to under specific measurements to evaluate the introduction of blockchain technology in eco-tourism development by checking carbon footprint, prosperity, and so on.

Data Analysis through ANOVA- Single Factor

This test evaluates whether two groups (levels) of a factor share the same mean. The data collected through a questionnaire were analyzed using one-way ANOVA, and the results are presented in an Excel figure. The first column of the summary lists various variables, while

2nd column suggests the variety of observations in each group. The 3rd column presents the overall sum of all information, with 4th column representing the implication of the statistics. Finally, the variance of all the data is shown in the last column.

The second table in the figure includes the terms SS, which stands for the sum of squares between groups, and dF, representing the degrees of freedom. The terms between groups and within groups denote the number of groups and the number of observations, respectively. SS is calculated as the degree of freedom divided by the mean sum square (MS), while the F statistic is the mean sum square divided by both values. If the p-value exceeds the alpha level, we do not reject the null hypothesis (H_0), which asserts that there is no significant difference. The p-value indicates the appropriate action regarding a given hypothesis.

In this analysis, our p-value is 1.0902196, which is greater than the alpha value of 0.05. Consequently, we will reject the alternative hypothesis and accept the null hypothesis. Therefore, based on the data analysis, there is no significant difference between the variables. This means Adoption and Awareness, Efficient and Handling, Safety and Security, E-Wallets, Scalability, and Problem & Challenges have no significant relation between them which implies that the blockchain technology is not solely dependent on the said variable as the p-value is more than the alpha value which indicates that Respondents' attitudes and perceptions about blockchain technology are not same. Improving the responder experience is crucial to recognizing the value of blockchain technology in tourism. The use of blockchain technology can improve stakeholder engagement in decision-making processes and satisfaction levels.

CONCLUSION

Through various perspectives, monitoring can yield valuable insights into both the opportunities and challenges of the blockchain era. This approach informed the creation of case studies, policy formulation, and industry practice reports. In this study, the P-value is 1.0902196, which is more than the alpha value of 0.05, there is no significant difference between the variables. This indicates that Adoption and Awareness, Efficient

Handling, Safety and Security, E-Wallets, Scalability, and Problems & Challenges do not have a significant relationship with one another. Thus, the dependence of blockchain technology on these variables is minimal, as the P-value surpasses the alpha value, suggesting that respondents' attitudes and perceptions of blockchain technology vary. Enhancing the responder's experience is crucial for gathering information on the importance of blockchain technology in tourism. The implementation of the blockchain era can enhance stakeholder engagement in decision-making processes and increase satisfaction over time as it becomes more user-friendly.

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Personal Financial Planning: Awareness, Attitude, and Financial Literacy Among Mumbai Residents

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ABSTRACT

Managing your finances, investing, and saving all fall under the umbrella of “personal finance.” This encompasses banking, insurance, investments, retirement, taxes, and estate planning alongside budgeting. Financial planning is important for everyone, whether they are elderly or a child in school. It is imperative that everyone start saving money at a young age for this reason. The research paper aims to investigate the people’s approach towards personal financial planning. The study seeks to explore the various facets of individual financial planning, including retirement planning, investing, budgeting, and saving.. Primary and secondary sources have both provided information for the study. A well-crafted questionnaire is used to get primary data from Mumbai city respondents, while material from numerous websites, publications, and articles is used to gather secondary data. It has been noted that good financial planning techniques can undoubtedly result in sound financial health.

KEYWORDS: *Literacy, Planning, Budgeting.*

INTRODUCTION

Personal finance refers to the organization and control of an individual’s financial matters such as earning, spending, saving, investing and safeguarding money. The expression is commonly used to refer to the entire industry providing financial services and investment guidance to households and individuals. The process of creating a personalized financial well-being roadmap is known as financial planning. Your finances, your ambitions, and your tolerance for risk are the factors that go into financial planning. The objective of the paper is to access the Current level of Financial Literacy and to ascertain the relationship between financial literacy and overall financial well-being The goal is to examine the most common and important aspects of individual financial management.

Objectives of the study

1. To determine the current level of Financial Literacy among the target population.
2. To determine the relationship between financial literacy and financial well being.
3. To ascertain the relationship between effective financial planning practices and financial well-being.

LITERATURE REVIEW

- 1) David S. Murphy and Scott Yetmar [1] conducted research to determine attitude of graduate students about personal financial planning. The purpose of the article was to present the results of a survey regarding the attitudes of American MBA students toward personal financial planning.. The results show that while the majority of respondents believe financial planning is essential and that creating a financial plan is something they would like to do, relatively few believe they possess the abilities and knowledge needed to create a financial plan on their own.
- 2) Dr. Harpreet Singh1, Dr. D. D. Chaturvedi and Prof. Dr. Anuradha Jain [2] conducted research

on Personal Finance Management of Indian Working Professionals. The objective of research was to determine the variables that impact the personal finance management of Indian working professionals and to quantify the factors that influence this management using exploratory factor analysis (EFA)... It was concluded that educational attainment, lifestyle, residency status, income and savings are the elements that influence the finance management of Indian working professionals.

Research methodology

Primary and secondary sources have both provided information for the study. Primary data is gathered from members of the public from various age groups, professions, and cultural backgrounds. A survey was obtained from total 126 respondents with varying demographic profiles provided the data.

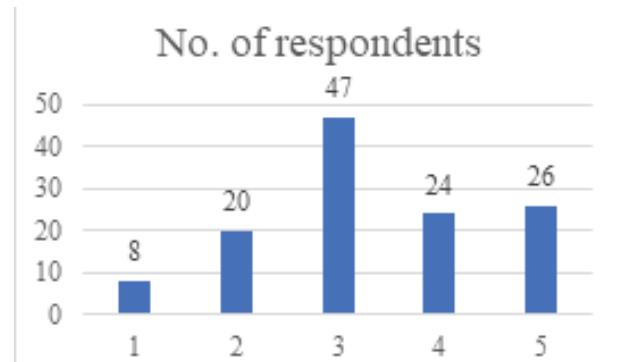
Interpretation of primary data collected

Table 1 Demographic factors of Respondents

		Number of Respondents
Gender	Male	84
	Female	42
	Total	126
Age	20-35	46
	35-45	14
	45-60	55
	60 & above	11
Occupation	Private employee	58
	Government employee	17
	Businessman	51
Monthly Income	Below Rs. 10,000	17
	Rs. 10,000 to 30,000	52
	Rs. 30,000 to 50,000	33
	Above Rs. 50,000	24
Qualification	Undergraduate	59
	Graduate	46
	Post Graduate	21

Table 2 Showing rating about respondents' level of financial literacy

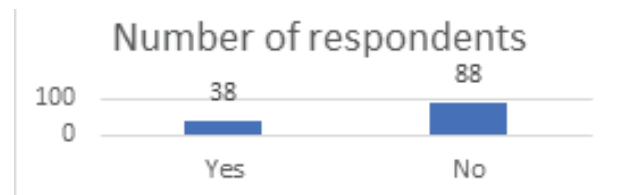
Rating (1 to 5) 1= Very Low 5= Very High.	Number of respondents
1	8
2	20
3	47
4	24
5	26



It can be observed that 6.35% of respondents exhibit low financial literacy, compared to 20.63% who demonstrate high financial literacy. 37.3 percent of participants possess a moderate level of financial literacy.

Table 3 Showing details whether respondents have attended financial education programmes in the past

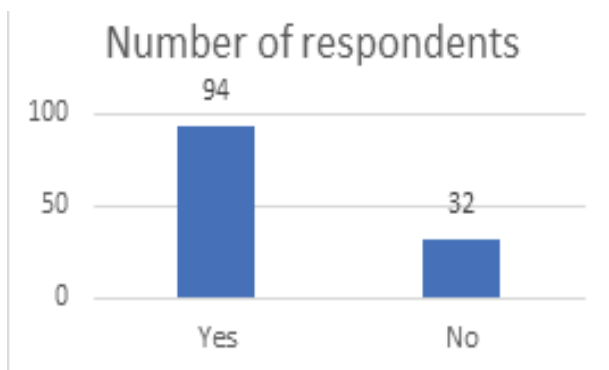
	Number of respondents
Yes	38
No	88



It can be seen that only 30.16 % of the respondents have attended financial education programmes in the past.

Table 4 Showing details whether respondents have Well-structured Personal Financial Plan

	Number of respondents
Yes	94
No	32



It can be seen that 74.6% respondents prepare well-structured personal financial plan.

Table 5 Showing details whether respondents follow monthly budgeting .

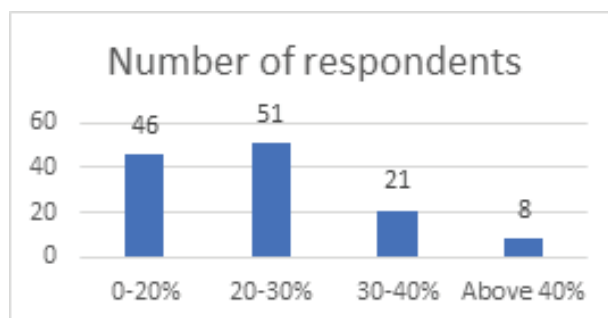
	Number of respondents
Yes	94
No	32



It can be seen 75% of the respondents prepare monthly budgets while the remaining do not follow monthly budgeting exercise.

Table 6 Showing details about average percentage of income usually saved

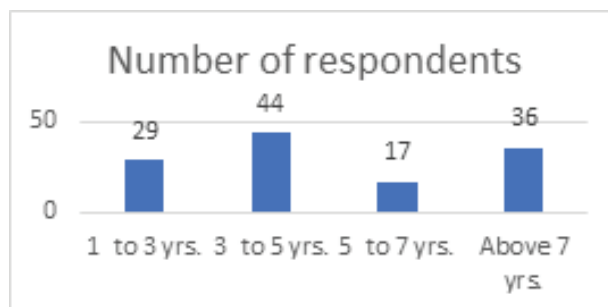
Options	Number of respondents
0-20%	46
20-30%	51
30-40%	21
Above 40%	08



Interpretation: It can be observed that 36.51% respondent's savings are below 20% of their income, while the majority (40.48%) respondents save about 20 to 30 % of their income. Also it can be seen that 6.35% of the respondent's savings are above 40% of their income.

Table 7 Showing details about average tenure opted for investment by respondents

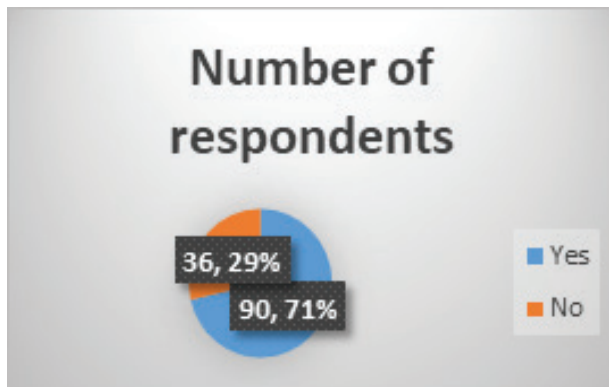
Years	Number of respondents
1 to 3	29
3 to 5	44
5 to 7	17
Above 7	36



It can be observed that 23.02% respondent's investment horizon is between 1 to 3 years, 34.92 % respondents invest for period between 3 to 5 years, 13.49 % respondents invest for a period between 5 to 7 years and the remaining 28.57 % respondents invest for more than 7 years.

Table 8: Showing details whether respondents have invested in life insurance plans

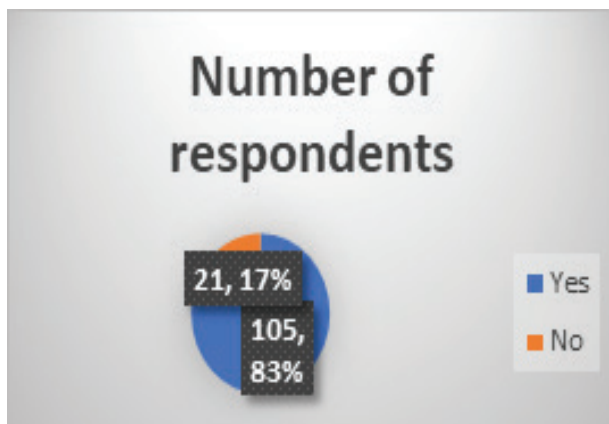
	No.of respondents
Yes	90
No	36



Interpretation: It can be observed that 71.43% have availed life insurance plan while the remaining have yet not invested in any life insurance policy.

Table 9: Showing details whether respondents have sufficient Health insurance plans

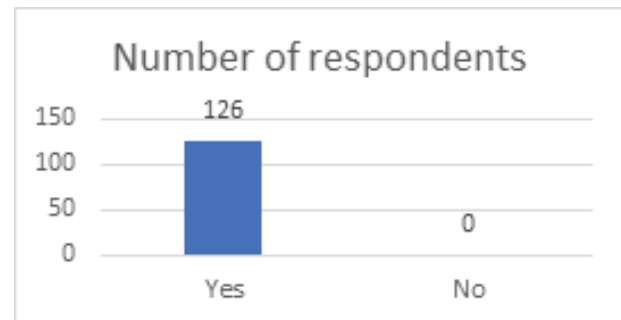
	No. of respondents
Yes	105
No	21



Interpretation: It can be observed that 83.33% respondents have availed medicliam policy,

Table 10: Showing details about respondent's awareness regarding Retirement planning

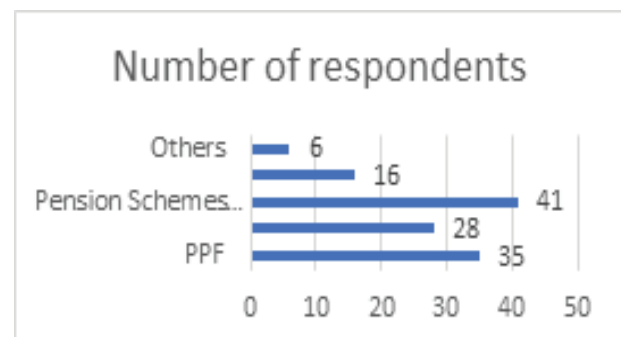
	Number of respondents
Yes	126
No	Nil



Interpretation: It can be observed that all the respondents are aware about retirement planning.

Table 11: Showing details about respondent's primary investment avenue opted for retirement planning

Investment avenue	No. of respondents
PPF	35
NPS	28
Pension Schemes (by Insurance companies	41
Equityshares/Mutual Funds	16
Others	6

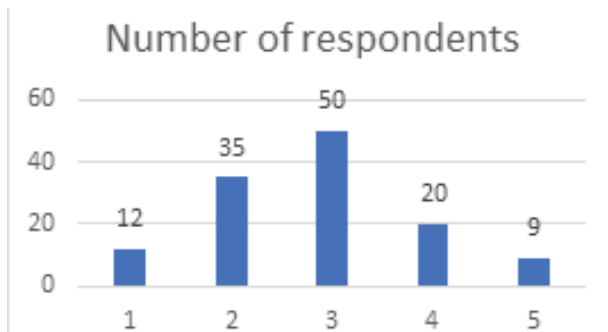


Interpretation: It can be seen that majority(32.54 %) have opted for pension schemes offered by insurance schemes for their retirement, the second most popular investment is public provident fund opted by 27.78 % respondents , NPS by 22.22% respondents , 12.7% respondents have opted Equity shares and mutual funds while the remaining have selected some other investment avenues for their retirement..

Interpretation: It can be observed that only 69% of the respondents have awareness about estate planning.

Table 12 : Showing rating about respondents overall Financial Well –being

Rating(1 to 5) 1= Very Low 5= Very High.	Number of respondents
1	12
2	35
3	50
4	20
5	09



Interpretation: It can be seen that 9.52 % of the respondents have very poor financial well-being , 39.68 % respondents have moderate level of financial well-being , while only 7.14% of the respondents have very high level of financial well-being.

Hypothesis Testing

H0: There is no significant correlation between the level of financial literacy and Overall Financial wellbeing.

Correlations				
			Literacy	Well being
Spearman's rho	Literacy	Correlation Coefficient	1.000	.393**
		Sig. (2-tailed)		.000
		N	126	126
	Well being	Correlation Coefficient	.393**	1.000
		Sig. (2-tailed)	.000	
		N	126	126
**. Correlation is significant at the 0.01 level (2-tailed).				

Analysis of Results

The Spearman's rank correlation coefficient between literacy and well-being is 0.393.

Significance Level (p-value): The p-value for this correlation is 0.000.

P-value (0.000) is less than Significance Level (0.01), thus we reject the null hypothesis. This indicates that a considerable moderate positive relationship exists between financial literacy and overall financial wellness.

FINDINGS

1. The financial literacy level among the people is moderate.
2. A significant portion of respondent's lack exposure to financial education programs.
3. While a majority follow structured financial plans and budgeting exercises, there is room for improvement in savings rates and investment strategies.
4. Most respondents have adequate insurance coverage and are aware of retirement planning.
5. Having higher financial literacy is connected to better financial well-being, indicating that enhancing financial knowledge can improve one's financial health.

CONCLUSION

The analysis reveals that there is a significant moderate positive correlation between financial literacy and overall financial well-being. Respondents with greater financial literacy tend to have better financial well-being. Despite this positive correlation, a large proportion of respondents have not attended financial education programs, indicating a potential area for improvement to enhance financial literacy and well-being further. Furthermore, until the significance and necessity of sound financial planning are understood, financial literacy on its own is insufficient. To achieve their financial goals and obligations, everyone needs a financial plan. Since none of us are endowed with this insight from birth, we need to educate ourselves on financial management and future planning. This will not only make our lives happier, but it will also have a

significant long-term effect on the development of our nation. Financial planning is encouraged by financial education alone in the formative years, particularly in schools and colleges.

RECOMMENDATIONS

1. Increase the availability and accessibility of financial education programs to improve financial literacy rates.
2. Encourage the development and adherence to personal financial plans and monthly budgeting to enhance financial well-being.
3. Provide incentives and education on the benefits of higher savings rates and diversified investments to improve financial stability.
4. Conduct campaigns and workshops to raise awareness about the importance of life and health insurance, as well as estate planning.

5. Educate respondents about the benefits of long-term investments to ensure better financial returns and security in the future.

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Compensation and Benefits: The Augmenters of Talent Acquisition, Motivation and Retention

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ABSTRACT

The goal of the research is to better understand and analyse the various compensation and benefit plans (CBP) available for successfully and efficiently managing the workforce. The study also looks into the impact of pay on the organization's ability to recruit, select, encourage, and retain skilled personnel. The study is based on a review of the literature. The data for the study was gathered from a variety of research journals, online materials, professional websites, and other sources.

According to the findings, organisations must establish a right balance of monetary and non-monetary remuneration and benefits in order to attract, motivate, and retain highly competent, skilled, and motivated employees. Organizations must be proactive in knowing their employees' financial and non-financial needs in order to improve the effectiveness of tasks such as recruitment, motivation, and retention.

KEYWORDS: *Compensation, Benefit, Recruitment, Motivation, Retention.*

INTRODUCTION

The employer has to take care of the compensation element if he wishes to retain the highly competent employees, the employer has to align the financial and non-financial aspects of the compensation with the expectations of the employee. Such kind of efforts is enabling both the stakeholders to prosper. [1]

Setting competitive advantages is the foundation of modern firms and efficient Human Resources Management. The proper and efficient compensation strategy is unquestionably a competitive advantage, and it is impossible to implement without a strategic pay market position. Talent management, career opportunities, and other HR processes are used in modern firms to extend the length of time that key individuals and job positions are employed. The organization's

health is maintained by strategic positioning in the pay market, which permits the other operations to run smoothly.

LITERATURE REVIEW

When it comes to performing a job search and accepting an offer, a candidate's salary might be a major consideration. When designing a compensation plan for your firm, you must first examine the organisational structure as a whole, as there are various different sorts of tactics to pick from. After that, go over the job descriptions again and make any necessary changes. Position descriptions that are well-defined are one factor to consider when determining a job's market value. After you've figured out what a position's responsibilities, talents, and education requirements are, you can start thinking about remuneration. [2]

From the dot-com era, you may recall the expression “employer of choice.” It was a moment of absurdly low unemployment, a time when businesses battled to locate talent at all, not simply the right skill at the right price. So they have done everything like assistance in dry cleaning of clothes, free food coupons and informal dress restrictions, among other things. Were they able to attract top talent because of these perks? That isn’t true. They merely increased the stakes for getting a decent hire once everyone had offered them. [3] Salaries and benefits are the most important factors that influence whether or not a candidate joins or stays with a company. However, if HR executives want to win today’s tumultuous talent wars, they must look beyond compensation.[4]

The significant association between moderation and compensation is explicitly defined by Vroom’s expectation theory. Fulfilling the expectation and offering rewards to efforts taken by an employee lead to motivation. In general, an employee in any organisation expects monetary compensation from his or her employer for tasks performed. The results of the research show a link between extrinsic motivation and the perceived characteristics of the whole compensation system. The aspect of financial compensation does not affect the intrinsic motivation of the employees, however promotion opportunities affects the intrinsic motivation. Workplace satisfaction and intent to leave are also influenced by the remuneration system. Our findings have consequences for both management and policy. [5] The study conducted [6] concluded that individualised compensation of selected high performing employees can be a factor of work motivation. Under certain circumstances, flexible pay to the average performing employees neither motivates nor increases job satisfaction.

The hypothesis of the study is that financial incentives are the only motivating type of compensation. This study identifies the motivational components that will ensure that surgeons at an AHSC operate to their maximum capabilities and allow the hospital to achieve its mission statement. As a result, they looked into a variety of topics, including compensation systems, surgeons’ opinions on which techniques are the best, the value doctor’s place on their activities, as well as the

right incentive level, and the variables that encourage surgeons to execute specific tasks. [7]

Organizational Culture, Organizational incentives and organizational support emerged as key factors with the first two factors indicating the cause for higher attrition. [8] Employee training and development is not favourable for employee retention if it is not followed up by a change in the compensation. This includes the opportunity to apply the newly acquired skills.[9] [10] Also employee salary impacted employee participation and employee retention. Hence employee involvement in manufacturing and service related sectors should adopt participative and consultative methods in order to retain their employees. For both employees and employers, compensation is one of the most sensitive topics. Compensation management that is both effective and efficient may help a business attract, develop, and retain talent.

SIGNIFICANCE OF THE STUDY

The study tries to gain insights into the role of compensation and benefit management as a tool for talent management. It further delves into the role of Compensation Management, at each of the stages of HR processes. It becomes an important aspect for employee recruitment, retention and employee productivity. It is the basis for attracting, motivating, and retaining the best employees.

DISCUSSIONS AND FINDINGS	Parameter
The study found that by giving equity shares a feeling of citizenship can be developed. This in turn helps organizations in talent acquisition. [10]	Talent Acquisition
The study revealed that relevant compensation design is playing significant role in attracting talent. [11]	
The study outcomes say that unfulfilled needs like satisfactory compensation plays significant role in recruitment. [12]	
Researchers argues that non-monetary benefits should give more weightage and this compensation design will increase the motivation. [13]	Talent Motivation.

The design of financial components of remuneration has no bearing on core motivation, but promotion chances do. [14]	
The study recommends that identification of requirement of employee is more important than what we offer for motivating work force. [15]	
The retention of employee is one of the fundamental challenge for every organization. [16]	Talent Retention
The happier an employee is with their job, the longer they will stay with the organisation. [17]	
Compensation has a substantial impact on the performance and retention of highly qualified and competent individuals [18]	
Proper pay design and job security have a major impact on employee retention. [19]	
Compensation and benefit design has a favourable impact on the organization's employee retention efforts. [20]	

DISCUSSION ON COMPENSATION ISSUES

In the months of September 2012 and September 2013, lawsuits were brought against well-known corporations such as Walmart Stores for failing to pay overtime to their employees and underpaying salaries in violation of federal statutes in the United States. Apple's electronic component supplier, Foxconn Electronics of China, had previously faced similar claims of underpayment of salaries and failure to compensate workers for excessive working hours. For many reasons, Kingfisher Airlines in India suffered losses and eventually failed to pay salaries to its employees for nearly seven months, resulting in a strike by its staff. The company's failure to pay its employees' salaries for months caused a major financial difficulty for one of its employees' families, encouraging his wife to commit suicide as a result of her depression. Employees at Kingfisher Airlines were so dissatisfied that they staged road protests against the company, which damaged the company's brand.

Recent examples include Walmart's claims to massive retail shops, which have been accompanied by severe allegations and lawsuits alleging that overtime earnings were not paid at least minimum wage in compliance with federal rules. Walmart stores require employees to arrive at work early, work during lunch breaks, and leave the job late, in violation of US federal labour rules.

DISCUSSION AND CONCLUSION OF THE STUDY

According to the study, in order to recruit, motivate, develop, and retain the organization's most competent and skilled people, the company must construct a right combination of monetary and non-monetary compensation and benefit components. These elements should meet the needs of both the employee and the employer, as well as the interests of significant stakeholders. According to the report, non-monetary advantages play an important role in attracting, motivating, and retaining the essential staff. Other variables affecting talent management efforts that need to be addressed by doing research in the near future were also highlighted in the study.

PRACTICAL IMPLICATION OF THE STUDY

The research could aid in comprehending the varied viewpoints on compensation and talent management. The study's findings will aid managers, leaders, compensation and benefits professionals, talent management, and HR professionals in understanding, developing, implementing, and evaluating various relevant tactics and strategies at various levels for achieving various success milestones and adding value in various management functions in an organisation.

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COVID-19, Mental Health of Children and Adolescent and Biotechnological Advancement

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ABSTRACT

The widely spread Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) which was formally termed (COVID-19) by the World Health Organization (WHO), a disease caused by the coronaviruses whose outbreak started from the city of Wuhan, China. Shockingly, the coronavirus attacks the central nervous system (CNS), this is done just after the infection is caused in the human body. This event leads to the entry in the central nervous system and then, virus gets spread in the brain as well as in neurons which causes neurodegenerative dysfunctions in the body. Further, this neurodegenerative dysfunction leads to mental disorders. Surprisingly, the individuals with mental health would be on higher risk for COVID-19 as compared to others. Although, it seemed like the children and the adolescent would not face such issues but actually these age groups too faced psychological stressors like anxiety, depression, and sleep disorders due to restrictions related to outdoor activities, loss of lives, and many more. To overcome such conditions yoga and meditation helped for both mental and physical well-being. To fight against the disease, various diagnostic approaches were used such as the PCR test, serological test, and computed tomography. Unexpectedly, the researches in the biotechnology field boomed and therapeutic methods like blocking of the viral entry, targeting the replication process of the coronavirus, convalescent plasma therapy, and immunotherapy was practiced so that the infection would be controlled. Furthermore, development of various vaccines took place to combat the COVID-19 virus. People are gradually getting accustomed with the coronavirus and researchers launched and are launching different methods to eliminate the infection of the virus to a great extent.

KEYWORDS: COVID-19, SARS-CoV-2, Biotechnological advancement, Vaccines, Mental health.

INTRODUCTION

Hubei Province's capital city named Wuhan, observed a shocking emergence of the coronavirus strain which was associated with the disease pneumonia in December, 2019. Later, in February, 2020, the International Committee on Taxonomy of Viruses named it Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) and then World Health Organization (WHO) formally termed as COVID-19 an illness produced by the coronaviruses. Interestingly, COVID-19 the name stands for the disease, where 'CO' denotes 'corona', 'VI' stands for virus, 'D' represents disease, and '19' denotes in which year the disease was detected. Coronaviruses possess the characteristics of

having positive sense single stranded RNA genome (+ssRNA). As, coronavirus has high replication rate as well as genetic recombination it affects the humans and is highly infectious and ultimately is the cause of ecological diversity. Therefore, the Director-General of the organization WHO acknowledged the COVID-19 outbreak as "a pandemic". Taxonomically, the SARS-Cov-2 is a member of coronaviruses family while their subgenus is Sarbecovirus. The SARS-Cov-2 replicate at the speed of 1.1×10^{-3} approximately per site per year. Surprisingly, this number corresponds to nearly one substitution around every 11 days. The SARS-Cov-2 genome is approximately 25 to 30kb also surface glycoprotein called structures protein codes for one-third genes of 3' end as well as two-third of 5' has orf1ab

that codes for polyproteins. Moreover, its structure also includes an envelope protein, membrane protein, and nucleocapsid proteins [1].

MECHANISM

Entry of coronaviruses into the host: First, there is attachment of the coronavirus to the cell and then the interface starts between the spike (S) protein of the virus and its receptor present in the host. S proteins that are found in coronaviruses are homotrimeric fusion glycoproteins in nature and they belong to class I fusion glycoprotein. These S proteins are further bifurcated into two different fragments namely S1 and S2. Particularly, S1 protein which is surface exposed has the receptor-binding domain called as (RBD). Additionally, RBD is present over the C- terminus of the SARS-CoV-2. Furthermore, it determines the pathogenicity by engaging the host cell. Also, the S2 domain that has seven repeat regions as well as fusion peptides. These mediate the blending of cellular and viral membranes after several conformational rearrangements. Later on, angiotensin-converting enzyme 2 (ACE2) was identified after several researches. The functional receptor ACE2 allows the attack of SARS-CoV in the human body. The RBD of S1 subunit comes in contact through ACE2 and only one of RBDs has the ability to turn in upward direction and forming such a conformation which is reachable by the receptor. In starting of the interaction, coronavirus remains in the dormant phase for short duration of time to bind with the ACE2 receptors in the host cell because the RBD is safeguarded by one of the component of S glycoprotein which is carbohydrate component and this protects the virus from antibodies. Moreover, the virus goes into the cytosol of target cell by following the receptor binding, this event is marked by acid-dependent proteolytic cleavage, this cleavage is performed by cathepsins or TMPRSS2 to S protein which is trailed by merging of the membranes of virus and cells. Interestingly, cleavage of the S protein takes place on two different spots, first split being for the separation of RBD and domains that are used in fusion of S protein, and second split is for exposure of fusion peptide (cleavage at S2'). The fusion peptide is exposed from S2' cleavage site which inserts into the membrane, this is accompanied by the development of antiparallel six-helix bundle. Ultimately, there is fusion of these

bundles that releases the viral genome in the cytoplasm of the host [2].

Replication and transcription: The organization of nsps takes place to form a set of machineries of protein or the replication-transcription complexes for the proper replication as well as transcription in the target cell. Moreover, balancing between the process like replication and transcription is there which is further directed by the interaction of the specific proteins. Further, the assembly of replicase complexes is followed by viral RNA synthesis. Interestingly, production of viral RNA yields genomic and sub genomic RNAs. Formation of nested RNAs take place with the help of positive sense sub genomic RNAs. All the two, sub-genomic and genomic RNAs production occur from negative-strand intermediates. The negative-strand intermediates consist of anti-leader sequences as well as poly-uridylyate sequences. The coronaviruses have the capability of recombination and this is performed from both homologous and non-homologous recombination. The recombination event is done by tying to the RNA-dependent RNA polymerase which has property of switching between strands. Probably, recombination plays a significant role in the evolution of viruses. Moreover, this event is the basis for RNA which is targeted [2].

Assembly and release: SARS-CoV-2 have several structural proteins but the protein which is found in abundance is the M protein which is type III glycoprotein. Its function is to describe the envelop of the virus. This protein helps in the central assembly. The humoral and cellular immune systems of the host identify M protein as an important immunogen. There is another structural protein known as envelope (E) protein which is the tiniest among all the structural proteins, its size is for about 79-109 amino acids. They contain one α -helical transmembrane domain. The site of E proteins is ER-Golgi intermediate compartment. Evidently, they are found at the time of replication cycle in the infected cells. Thereby, the above mentioned proteins get in the endoplasmic reticulum (ER). The viral genomes that the N protein has encapsulated will spread in the compartment. The releasing of viruses is done by the process of exocytosis also the transportation of the viruses is from the vesicles [2].

MENTAL HEALTH IN PANDEMIC

Impact on central nervous system: Particularly, the part of brain which is known as hypothalamus might lead to the immune dysregulation. The hypothalamic-pituitary-adrenocortical axis (HPA) is associated with various cytokines of COVID-19 namely IL-6, IL-1 β , and TNF. The activation of HPA axis is through blood brain barrier dysfunction and neuromuscular inflammation. The SARS-CoV-2 attacks brain (CNS) just after the infection is caused. After the entry in the CNS, the spreading of the virus takes place in brain as well as in neurons leading to neurodegenerative dysfunctions. This was quite common and was found in the patient's early report in Wuhan. The percentages of patients rose to 36.4%. Moreover, the discovery of hemosiderin deposits, which largely serve as an indicator of viral infection and microhemorrhages in various brain areas. The CNS of COVID-19 patients has been shown to have a higher concentration of ferritin which have been linked with the iron storage complex, partially digested lysosomes, and ferritins [3].

Mental health of young age group: Children show lower risk towards the pandemic because they tend to develop a syndrome called as multisystemic inflammatory syndrome. The generation of biopsychosocial stressors during the pandemic to which children and adolescent might be exposed. Unruly stress throughout the childhood led to malfunction in the hypothalamic-pituitary-adrenal axis. Further, predisposition of the children takes place by the development of situations like pathophysiology at the time of adulthood. Tireless mental stress leads to the damaging of the nervous system. In particular, amygdala, hippocampus, and prefrontal cortex. These areas of the brain perform responses associated with stress that basically effect to the methods related to the reaction of glial cells. Later on, impacting the mental health and occurrence of apoptosis. Around the globe, approximately, 10-20% of the population of adolescent are the victims of mental health situations. This figure is likely to change depending upon the mental status of this particular age group during the time of pandemic. The negative impacts due to poor mental health could vary to person to person and the result would be behavioural problems, emotional distress, and many more [3].

Adolescents are at a susceptible stage of development as most of the disorders related to mind start during this phase of life. The rates related to psychological distress tend to increase in the adolescent phase. For instance, the occurrence of depression rose to 13.2% in the year 2017 from 8.7% in the year 2005. Even though, the pandemic affected everyone but the impact was more on women as well as young adults leading to issues related to anger, anxiety, depression, and many more. Moreover, the symptoms related to anxiety and depression were from 6.33% to 50.9% and 14.6% to 48.3%, respectively [3].

TECHNOLOGY

Due to advent of technology life has become quite easier. Similar, is the case of detection of the COVID-19, to eradicate the pandemic less challenging methods that is digital health technologies are used as compared to manual strategies that are tedious to execute. Further, COVID-19 can be detected by pulse oximeter, digital thermometer and thermal scanners, and many more.

Clustered regularly interspaced short palindromic repeats (CRISPR)/Cas system: There are various detection tools that worked on (CRISPR)/Cas system and it has better precision in detecting and has good results related to diagnosis. In addition, activities like genomic research, therapies related to genes as well as mapping have been converted to RNA-guided endonuclease (RGEN)-based CRISPR/Cas system. Interestingly, the immune systems of microorganisms are opposed to proteins like CRISPR and Cas. Also, systems like CRISPR can be used in molecular detection because Cas genes were found near to the array which codes for it. As well as, these systems could be used efficiently and effectively to get the results of molecular diagnostics in about 30 to 60 minutes. Additionally, for detection of coronaviruses, when this procedure got advanced, time to get the results decreased to a great extent.

Pulse oximeter: For monitoring the arterial oxygen saturation level at home pulse oximeter is used so that whenever patients find the symptoms related to hypoxemia, they could look up to the medications. Currently, pulse oximetry is contemplated in routine of preoperative care.

DIAGNOSTIC APPROACHES OF COVID-19

There are diagnostic tests which are vigorous and accurate and plays significant role in finding the infectious stage in the patients. Various tests are important so that prognosis and monitoring of the disease can be done. Tests like PCR-based test, serological tests, nanoparticle based serological tests, CT imaging are quite successful in detection of illness.

1. PCR: It is a genetic test in which reverse transcription-polymerase chain reaction often called RT-PCR is recorded as the common test used in diagnosis of the disease COVID-19. Most of the times, ocular secretions and nasal swabs are used as samples. The procedure is: 1. Nasal swab, 2. Specimen collection, 3. Extraction of RNA, 4. Reverse transcription to DNA, 5. RT-qpcr (Initiation, Denaturation, Primer, annealing, Extension), 6. Result

Serological test: It is particular type of test in which blood serum, or fluids are analyzed in the presence of specific biomarkers, basically to study the stages of the disease and its progression. Serological test like enzyme-linked immunosorbent assay (ELISA) is being used to test the existence of the virus in human body. Furthermore, in the process of ELISA detection of the antibodies are done against the viral antigens. Most probably, they resemble like the micro well plate [4].

CT imaging: Computed tomography scan was prominently used to detect an infection in the body and was used in such nations where the testing kits were not available in the starting phase of the pandemic. Moreover, irregular observations in the image of the CT scan witnessed as a diagnostic feature for the disease [4].

BIOTECHNOLOGICAL ADVANCEMENT

Vaccines play a significant role in controlling, preventing or eradicating the diseases. Further, the approval of the COVID-19 vaccines presented an important role for the pandemic. Unfortunately, as the pandemic hit the world everyone was devastated and after the widespread of vaccinations, hopes developed that the situation that had become uncontrollable now could be in hand.

Therapeutic approaches

1. Blocking viral entry: ACE2 receptors are the target for COVID-19. Moreover, ACE2 is over shown in tissues of lungs and gastro intestine of humans. The event of endocytosis which is receptor based occurs when binding of RBD with ACE2 takes place [4].
2. Targeting the coronavirus replication: Drugs like chloroquine, nafamostat causes prevention of endocytosis. Also, drugs like colchicine, vinorelbine inhibit the maturation of endosome. Further, drugs such as cinanserine prevent the releasement of the viral genome in the target cell. On top of every event, processes like transcription, translation and replication of the virus can also be stopped by using drugs like bananin, remdesivir, and many more [4].
3. Convalescent plasma therapy: This type of therapy is an investigational therapy related to COVID-19. Surprisingly, the patients are injected with the antibodies that were developed by the recovered patients from the COVID-19 and it showed better results. The convalescent plasma therapy is effective during the initial stages of the infection [4].
4. Immunotherapy: Patients suffer from cytokine storm due to the development of the disease in the body. This affects the lungs, causing inflammation and finally producing a syndrome called acute respiratory distress syndrome (ARDS). Therefore, to fight effectively immunotherapies are used [4].

Development and progress of vaccine technology

The biggest challenge during the pandemic was to develop an efficient and effective vaccine which is also safe, so that the body of the individual prepare antibodies against foreign particles. The basic objective of these vaccines is to save the individuals from the rigorousness of the disease. Surprisingly, several studies show that there is a significant link between BCG vaccine and COVID-19 because there was some similarity in the sequence of amino acids which are expressed by both BCG strains and COVID-19 virus.

There are various approaches and are mentioned below:

1. Inactivated vaccines: It is a type of vaccine that

includes killed virus which may be killed by various means like heat, chemical, and many more. For instance, vaccines of flu and polio [5].

2. Viral vector vaccines: The replicating or non-replicating safe viruses are used in this type of vaccines where specific disease causing part of pathogen is injected so that stimulation of the immune system of host body could be done. For example, Ebola vaccine [5].
3. RNA based vaccines: Encapsulation of lipid nanoparticle into the mRNA of disease causing virus is done. For example, zika virus [5].
4. DNA based vaccines: Electroporation technique is used for the delivery of DNA of the disease causing component. For instance, influenza virus [5].
5. Subunit vaccines: Several antigens that are purified and have the ability to trigger the immune system of humans are used. Neither, pathogen is introduced in the body nor requirement of safe viral vector is there the example can be Hepatitis-B vaccine [5].
6. Nucleic acid vaccine: A vector is used to produce an antigen in the body and it has the ability to activate the immune system. The genetic code is just carried to the host body. For example, vaccine against MERS-COV [5].

CONCLUSION

The world observed a tragic hit of a virus called COVID-19 in the year 2019. Shockingly, the virus evolved to a great extent in a short duration of time from the genera Alphacoronavirus to Deltacoronavirus, with delta coronavirus being the most dangerous to the mankind. While, the major target site of the corona virus in humans was the respiratory and gastrointestinal tract. Moving on, because of outbreak of the pandemic the central nervous system was affected and this led to the mental disorders among the individuals. Most

prominently, children and adolescents were affected because of the lockdown and strict prohibition of the outside activities. Also, there were various diagnostic approaches to find out the level of infection in the body. To control the infection globally, doctors used different types of methodologies to inhibit the growth of the coronavirus in the body. Evidently, the world witnessed the booming of the biotechnological field because of development of various types of vaccines to combat the situation as quickly as possible. Moreover, due to advent in the biotechnology field the pandemic was controlled, although there was a lot of loss of lives throughout the globe. In addition, the research related to the medicines, to find out the level of infection of COVID- 19 is still going on to eradicate the virus completely. There is also a chance that the technology becomes more advanced and the coronavirus prevention vaccine are given to newborns itself.

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Emotional Intelligence of Academicians in Technical Institutions in Bengaluru– Moderating Role Excellence in Artificial Intelligence

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ABSTRACT

The Emotional intelligence (EI) of academicians is vital in the technical education institutions. Academicians with high EI handle the stress and pressure of teaching a challenging subject well. In light of this, the current study looked at demographic (age, gender, educational attainment, marital status, and yearly income) and work-related factors (job positions, experience, work hours) characteristics as predictors of EI levels. The study also aims to understand the moderating role of artificial intelligence excellence in augmenting the teaching process in technical education institutions. The study is exploratory in Nature and a sample size of 160 Academicians is taken under the study based on the Cochran formula of known population-95% confidence and 10% margin of error. A well-structured questionnaire was used which was adapted from Goleman EI Scale of 2012. SPSS Software was used and ANOVA and independent t test was used to test the Hypothesis. Academicians above the age of 45 years had better EI, according to a survey of demographic characteristics. For marital status and monthly income, EI elements are negligible. In comparison to males, women have a higher level of self-awareness. The majority of the factors in the Work profile were negligible. Differences in EI levels among Academicians were identified based on several demographic and work-related variables. In addition, the study's findings highlight how EI, a component of artificial intelligence, greatly influences the classroom experience. Findings indicate that additional research is required to compare academics to other knowledge professions.

KEYWORDS: *Emotional intelligence, Work profile, Demographic profile, Academicians.*

INTRODUCTION

There has been growing recognition that Emotional Intelligence (EI) can predict an individual's performance and productivity [1]. Notwithstanding concerns about the reliability of EI assessments, many authors agree that EI does have an effect on performance [2]. EI has a favourable correlation with self-efficacy, a crucial component of psychological capital [3]. Consequently, EI is still a hot subject since businesses are seeking methods to ensure consistency in their HR practices. In this regard, it is very important to keep one's EI levels high, since it is directly associated with one's ability to deal with variety and change [4].

The EI of academicians is vital in the technical education institutions [5]. It gives them the ability to control their emotional state, while also controlling the state of their students as well. Academicians with high EI handle the stress and pressure of teaching a challenging subject well. They are also better at conflict management resolution and developing good relationships with colleagues and students [6]. But with the advent of artificial intelligence, AI has the ability to help with some facets of education, but it cannot replace the human bonding that is an integral part of teaching. And thus, it is needed that any practicing educators continue to develop their EI skills with the complexities that are ever arising within educational systems today

By combining emotional and artificial intelligence, we can help build a classroom that enables us to meet with a full intention & deliver the best of our ability for all [7].

A person's EI can be influenced by a number of factors, though. Biological, psychological, and social factors all contribute to EI levels. Some academics argue that EI can be improved, most likely through improvement programmes and awareness seminars. Based on the findings of [8] and [9], this study looked at demographic (age, gender, qualification, marital status, and annual income) and work-related variables (job roles, experience, work shift, work hours, overtime, and flexitime) variables as predictors of EI levels.

REVIEW OF LITERATURE

Age also has an effect on EI and unproductive work behaviour. Workers at the Chalkida Municipality are highly intelligent people who are not likely to do anything that might hurt the company's productivity [10]. Researchers in Malaysia looked at the relationship between demographics and EI in faculty members at polytechnic institutions [11]. According to the study's authors, EI increases with time in the classroom, seniority, training, and education. There was no correlation between the gender gap and previous work experience and the EI requirement. Regardless of one's gender, there is no difference in EI, as asserted by [12]. Previous studies have shown that women tend to have higher levels of EI compared to men, regardless of the setting (personal or professional). Both at home and in the workplace, women's emotional capacities are stronger [13]. Researchers found a correlation between societal expectations of masculinity and femininity as well as human values and the gender gap in participation in various activities. [14] The Examined the gender gap in self-esteem among 261 English adults using a correlational sample. The study discovered that gender has a crucial role in determining EI as perceived by one's self-esteem.

Age, marital status, level of education, and EI were some of the demographic variables studied in relation to one another in a study [12]. In terms of EI, the

results showed that gender and service period were differentiating factors. While some research has shown a correlation between EQ and longevity in the workforce, other studies have failed to uncover any such link. When looking at the EI of teachers at technical and vocational colleges in Malaysia, another study [13] discovered no differences based on gender or age.

Several research previously had investigated the influence of artificial intelligence on performance teachers in technical and vocational institution [15].

Research Gap: A number of factors can influence a person's degree of EI. Biological, psychological, and social factors all have a role in EI levels. Some scholars think that EI can be enhanced, most likely by training and awareness of Academicians. This study looked at demographic (age, gender, qualification, marital status, and annual income) and work-related variables (job roles, experience, work shift, work hours, overtime, and flexitime) variables as predictors of EI levels, based on the findings [2] and [3]. There is lack of studies which analyse the moderating role of artificial intelligence excellence on the relationship between EI and enhanced teaching process [12], [13], [14].

Objectives

- To assess the impact of demographic profile of Academicians on their EI
- To analyses the impact of work profile of Academicians on their EI
- To examine the moderating role of artificial intelligence excellence on the relationship between EI and enhanced teaching process.

RESEARCH METHODS

The current study is exploratory in nature and employs quantitative data to analyse the objectives of the study. A sample size of 160 Academicians is taken under the study based on the Cochran formula of known population-95% confidence and 10% margin of error. The Academicians were selected from different technical education colleges across the Bangalore city to ensure a diverse representation. The data collection was conducted through a structured questionnaire

that included various demographic and professional variables. A well-structured questionnaire was used which was adapted from Goleman EI Scale [12]. Excellence of artificial intelligence items were adopted from the study of [7]. SPSS Software was used and ANOVA and independent t test was used to test the Hypothesis. Andrew Hayes process macros model -1 was used to test the moderating role of artificial intelligence excellence among technical academicians

RESULTS AND DISCUSSION

Demographic Profile of the respondents

A majority of 55% of the Academicians are in the age group of 26-45 years, 27.9% respondents are in the age group of 36-45 years. A very percentage of respondents are in the range of 18-25 years and above 45 years. 68.2 % respondents are female and remaining 31.8% are Male. A majority 58% of respondents have completed their Post-graduation, 51% have completed their graduation. As the study is carried out across technical education industry, a preponderance respondents are highly qualified. About half 51.2 % respondents are married, 46.5% respondents are single. Half of the respondents under study earn between 2-6 lakhs, 39% earn above 10 lakhs.

Work profile of the respondents

When enquired about the Job levels, 46.5% respondents are Lecturers, 22.5% respondents are in the Assistant professors, 20.2% Academicians are Associate professors and a very small percentage of Academicians are Phd's . 48.1% respondents have below 5 years of experience, 30.2% respondents have 5-10 years. A cumulative 21% respondent have above 10 years of experience. A majority of 49.6% respondents work 9-10 hours, 36.4 % Academicians worked for 6-8 hours. A very small 14% respondent's work for more than 10 hours a day. 44.2percentage respondents worked overtime once in a week and 15.5% Academicians did not work overtime.

Testing of Hypothesis

H1: There is a significant impact of demographic variables on EI of Academicians.

Table 1. Statistical test Results for Hypothesis 1

Demographic Variables	ANOVA- F Statistics				Independent t test
	Age	Qualification	Marital Status	Monthly Income	Gender
Self-awareness	3.334*	3.687*	0.565	0.659	6.196*
Self-Management	4.922*	1.835	0.151	3.034	4.547
Social Awareness	9.827*	1.217	0.276	2.413	4.029
Relationship Mgt	13.678*	1.392	0.037	2.289	1.361

EI items are statistically significant for atleast one of the Age groups at p value =.000. The scheffe post hoc results show that Academicians who are in age group of above 45 years have higher EI. The results of the present study align with other research indicating a favourable correlation between EI and age. As people become older, they may be more likely to understand their own and others' emotions as a result of their life experiences and learning. Self-Awareness item is statistically significant for atleast one of the Qualification groups at p value =.000. All other EI items are insignificant. The study's findings are consistent with [10], which found that EI values varied by qualification, with non-technical personnel in the Indian service industry being more emotionally intelligent than their technical counterparts. Academicians with professional degrees are more emotionally intelligent in the current study. EI items are insignificant for marital status and Monthly Income [8]. This research also found no significant differences in EI between married and single university professors. In case of gender, only self-awareness is statistically significant and female have higher self-awareness as compared to men. The findings of the study corroborate those of [12], who found that genders differed in EI, with females scoring better than males.

H2: There is a significant impact of work related variables on EI of IT Academicians

Table 2. Statistical test Results for Hypothesis 2

Work related variables	Job roles	Experience	Hours of work
Self-awareness	1.275	2.632	2.412
Self-Management	0.997	3.538*	3.818*
Social Awareness	2.358	7.226*	8.180*
Relationship Mgt	2.127	3.736*	3.724*

Job roles are insignificant in making any impact on the EI items as the significance values are above the expected p value of 0.05. EI constructs are statistically significant for atleast one of the Experience groups at p value =.000. The scheffe post hoc results show that Academicians who have above 10 years of experience have higher EI. EI Constructs are statistically significant for atleast one of the work hours groups at p value =.000. The scheffe post hoc results show that Academicians who work between 6-8 hours have higher EI

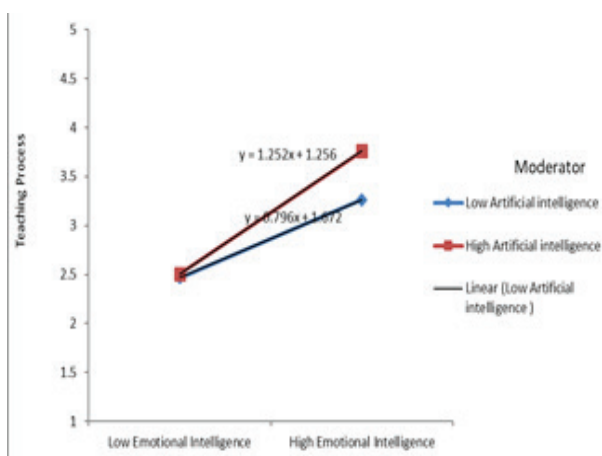
H3: Artificial intelligence excellence moderates the relationship between EI and enhanced teaching process

Table 3. Moderation analysis results

Variable names	
Independent variable:	EI
Moderator:	Artificial intelligence
Dependent variable	Teaching Process
Unstandardized Regression Coefficients:	
Independent variable:	0.512
Moderator:	0.134
Interaction:	0.114
Intercept / Constant:	3

The unstandardized co-efficient from the moderation analysis results show that the interaction term of 0.114 indicates a strong positive effect of artificial intelligence excellence among academicians in technical education institutions.

Chart 1- Linear regression - Moderation analysis results



The linear equation of $y = 1.252x + 1.256$ indicates that artificial intelligence excellence among academicians strengthens the positive relationship between EI and teaching process. The implication is that as Academicians A.I. skills get better, their EI gets stronger with teaching process which makes them more effective at maintaining the student engagement side of things. This relationship underscores the need for technological and EI training in curricula to benefit teachers as part of more holistic educational experience. In the end, they form a formula highlighting AI utilization in education as a circumstance to grow EI and enhance teaching practices.

Recommendations

- Academicians who are below 45 years need to access their EI through questionnaires and try to adopt to some of the techniques to improve EI. Organizations can take up activities and training programmes to enhance the EI of Academicians who are below 45 years
- Male Academicians can work on their self-awareness, Organizations can set up special programmers for men to enhance their self-awareness.
- Post graduates in technical field need to enhance their emotional skills to be equally competent with their non-technical counterparts. During the training sessions, importance has to be given to Technical Academicians so as to improve their emotional knowledge
- The proficiency of artificial intelligence has fortified the relationship between the EI of academicians in technical education institutions, thereby improving the teaching process. Therefore, educators in technical institutions should utilise the synergistic impact of artificial intelligence and EI to improve the teaching process.

CONCLUSION

Findings from this study add to what is already known about academics' EI. Academics interested in professional and personal development, HR departments, and career counsellors can all learn something from this study's findings. The study found that academics with

higher EQ were more likely to have strong relationships with their colleagues, take the lead when needed, and be happy in their work. Based on the findings of this study, academic institutions can reap substantial benefits for both individual scholars and the overall organisational climate by implementing measures to train and enhance EI. In addition, career counsellors can use the study's findings to help academics develop their EI competencies and chart a course for professional success. Based on a number of demographic and occupational factors, differences in academics' degrees of EI (EI) were observed. EI (EI) may be legitimately influenced by demographic and occupational variables, even though most of these factors showed no statistical significance. According to the results, academic women showed slightly higher levels of EI than men. Based on this finding, it appears that gender may have a role in how EI is shaped. One other thing the study found is that academics with more experience tend to have higher levels of EI. This provides more evidence that factors connected to one's occupation, like possibilities for advancement and exposure to different work settings, could contribute to the development of EI. These results highlight the importance of considering contextual factors in addition to individual ones while studying and enhancing EI in academics. The results also demonstrated that academics' EI and the quality of AI they use to improve instruction at technical education institutions go hand in hand. Scientists in the field of technical education would do well to improve their teaching methods by combining AI with EI.

The findings suggest that additional research is required in order to draw parallels between Academicians and Other Knowledge workers. This comparative analysis may facilitate the identification of particular characteristics that might contribute to the elevated levels of EI observed among those in academia. Moreover, gaining a comprehensive awareness of the distinctions between Academicians and other knowledge workers can offer valuable insights into the optimal methods for fostering EI in many working environments. In summary, the aforementioned data indicate that EI is a multifaceted concept that is subject to the influence of both personal attributes and the particular work environment in which individuals operate.

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Impact of USFDA Approval on Selected Indian Pharma Stocks

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ABSTRACT

Pharma stocks are sensitive to market information, particularly USFDA approvals for pharma products. Present study investigates the impact of USFDA announcements for selected six pharmaceutical companies from the year 2018 to 2023. Total 67 USFDA approvals of selected stocks are analyzed with the help of market model of event study methodology to assess whether these approvals influence stock prices or not. Findings of the study indicates that the effect is statistically insignificant for daily stock returns while having long term aggregate impact on selected pharma stocks. Average abnormal returns fluctuate around zero which indicates mixed market reactions towards USFDA approvals. This response of stock prices can be attributed to other factors such as industry trends, market factors and other external factors that overshadow the direct and short term impact of USFDA approvals. The results of the study are helpful to investors and industry stakeholders of pharmaceutical sector for informed decision making.

KEYWORDS: *Stock price, USFDA approvals, Event study, Abnormal return, Average abnormal return.*

INTRODUCTION

The Indian pharmaceutical sector is one of the significant contributors in the global healthcare in form of its exports and supply of affordable drugs. This sector's success is essential for maintaining global access to affordable medicines while reinforcing India's position as a key player in the global pharmaceutical market. At the same time, mapping with global requirements in terms of compliances, approvals, meeting high quality standards as well as cost aspects are crucial for those pharmaceutical firms who would like to expand in the global market. The United States Food and Drug Administration (USFDA) approval is important for those Indian companies who want to expand their market share particularly in the U.S. market. Parallel to USFDA approvals, financial performance of Indian pharmaceutical companies must be maintained to sustain in global market.

Performance of pharmaceutical companies is closely linked with stock market at domestic as well as international level. Stakeholders are always keen to

know developments in the sector as their sentiments and stock valuations are being affected by them. The financial performance of these companies is reflected in their stocks where factors like earnings, dividend declaration, clinical trials, regulatory compliances and approvals play a crucial role. Among these, regulatory approvals from the United States Food and Drug Administration (USFDA) are especially impactful, given the significance of the U.S. market for Indian pharmaceutical exports [1]. USFDA approvals are critical and such approvals lead to notable fluctuations in the stock prices of pharmaceutical companies with positive investors' sentiments. The market's reaction to these announcements can offer insights into investor confidence and expectations regarding the future performance of the approved products [2].

RELATED WORK

Past studies have been conducted in foreign countries to trace the effect of USFDA announcements on stock prices while there is a considerable literature available on USFDA approval in context of pharmaceutical

companies as well as India. Present literature review covers the potential areas for gap of research and for further exploration.

Pharmaceutical sector is one of the ideal sector to study the impact of regulatory announcements on stock prices as adherence to regulatory requirements is utmost important in this field. Announcements related to clinical trials and approvals from regulatory bodies are critical for pharmaceutical companies. To support this, researchers in [2] examined the reaction of USFDA announcements on share prices of selected Indian pharma companies through event study methodology. He has studied the effect of 21 USFDA announcements and tried to test efficient market hypothesis with the help of market model of event study. He found that there was a notable effect of positive announcement on stock price movement than negative announcement. Study has concluded that USFDA announcements affect stock prices of Indian pharma companies irrespective of nature of news in the market whereas researchers in [3] investigated the effect of specifically FDA related announcements at different stages. They found that investors tend to react positively to FDA approval and negatively to FDA rejection. The extent of negative reaction also be higher than positive reaction towards announcements. They have also observed that investors adjust their expectations throughout the FDA approval process which leads to reduce uncertainty with final approval. In market, small firms are able to get the benefits than pioneering firms; however investors were reluctant to invest in later firms showing the indirect relationship between announcement effects and first mover firms. They have also observed higher abnormal return in case of initial approval stage and drug approval stage of FDA as compared to abnormal return of final approval. They have also compared the results of approval sample and seen that the effect of announcement has been observed around 2 days window from the day of announcement. Study on economic consequences of USFDA new drug approvals in Taiwan conducted by researchers in [4] and found that stock prices tend to react positively drug in context of biotech and pharmaceutical companies. There was a positive impact on CARs of stock prices in most of the stages of new drug approval process by USFDA. However, investors tend to invest in later stages of drug

approval due to high rate of failure in initial stages. They also observed that investment in research is positively related to CARs of stock returns as it will subsequently reduce taxes and other operating costs for both biotech as well as pharmaceutical companies. They concluded that USFDA approvals and R&D investments in biotech and pharmaceutical companies are important indicators for stock investment. They have positive impact of CARs particularly after introduction of “Taiwanese biotech and new pharmaceutical development act” with inclusion of tax benefits and favorable policies. Researcher in [5] analyzed the market reaction of 319 drug approval announcements in the pharmaceutical industry. He used event study methodology by employing OLS regression model and found positive abnormal return around 5 days. Higher abnormal return can be found in companies having high capacity for R&D expenditure than other firms. Regulatory approval is one of the important milestones for pharmaceutical companies which lead to generation of revenue for new drugs. He also stated the limitation of the study for inclusion of only major drugs from center watch database. He also suggested exploring further research related to portfolio diversity which can be studied to know the market reaction for drug approval as number of drugs a company is having might affect the same. The opposite trend in stock prices had been found in the study of researchers in [6] wherein they analysed company stock prices before and after public announcements related to oncology drugs from USFDA. They analysed the stock prices in context of announcements related to experimental anticancer drugs owned by companies from the year 2000 to 2009. Drugs which are in phase III trials have been evaluated for the study. Results of clinical trial for 120 trading days before and after event window had been considered for the observing positive and negative outcomes. They found that company’s stock prices did not differ statistically between companies with positive and companies with negative decisions while the trends of stock prices before the first public announcement differ from those companies that report positive or negative trials.

DATA AND METHODOLOGY

The main objective of the study is to examine the impact of USFDA announcements on stock prices of selected

pharma stocks. Present study is analytical in nature as it focuses on observing the impact of USFDA approval on prices of selected pharma stocks. 67 announcements related to USFDA approvals from six pharmaceutical companies has been taken for the study after removing the effect of confounding events. Secondary data of daily closing price of stocks and NIFTY pharma index has been collected from the year 2018 to 2023 from the official website of National Stock Exchange of India.

Event study methodology

Event study methodology is mainly applicable to economics and finance to study different types of events which are internally as well as externally attributed. Following hypothesis is developed to study the objective of the research with the help of t-statistics.

Ho: There is no significant impact of USFDA approval on selected Indian pharma stocks

Ha: There is a significant impact of USFDA approval on selected Indian pharma stocks

Market Model

Market model is one of the famous tool used in event studies which allows researcher to attribute the abnormal returns to specific events. In this study, the event day is the date on which USFDA announcement had been made and the prior day in case of non-trading day. Event window is considered as $t = -10$ to $t = +10$ i.e. 21 days and estimation window is of 120 days prior to the event window for the calculation of regression coefficients. Daily expected return and abnormal return over a period of 21 days event window is calculated through following formulae:

$$E(R_{it}) = \alpha_i + \beta_i * R_{mt}$$

Where, α = Alpha coefficient of 'ith' security

β = Beta coefficient of 'ith' security

R_{mt} = Daily return of Pharma Nifty index during period 't'

$$AR_{it} = R_{it} - (E(R_{it}))$$

Where, R_{it} = Daily return of 'ith' security during period 't'

$E(R_{it})$ = Daily expected return of 'ith' security during period 't'

RESULTS AND DISCUSSION

Results of the study has been presented in the context of calculation of average abnormal return and t-statistic at 5% and 10% significance of three companies for USFDA approvals between years 2018 to 2023. In case of Sun Pharmaceuticals Industries Ltd., AAR on -1 day was positive but becomes negative on the day of announcement and consistently shows negative trend for next 2 days. Positive AAR has been found on +3, +5, +7 and +9 days after the date of announcement showing that positive information has conveyed to the market. Overall AAR ranges from -0.53% to 1.26% which provides opportunities to earn abnormal returns. Dr. Reddy's stocks shows negative AAR on -1 day while positive AAR on the day of announcement followed by next 3 days providing investors the opportunity for abnormal gain. It becomes negative on +4 and +5 days showing no impact of USFDA approval. AAR of Cipla Ltd. found statistically significant at 5% on -2 and -6 days with -0.34 and +0.64 respectively showing mixed market response.

AAR of Biocon Ltd. was found statistically significant at 10% level on -3 day showing the negative return of -1.09% followed by positive return on -2 and -1 days. Negative AAR found on the day of announcement showing the insignificant impact of the event. In case of Cadila Ltd., AAR stood positive on the day of event and on +1 day showing positive impact of USFDA approval and statistically significant on +5 and -10 day with -0.97% and -0.35% respectively which shows mixed market response for stocks. Positive AAR is there on the day of event and on -3, -4 and -5 days prior to the event day in case of Aurobindo pharma stocks. AAR on -5 day was found statistically significant at 10% with 0.056% reflecting the opportunity for abnormal gain for investors whereas in rest of the days, mixed response was observed.

Overall results indicates that average abnormal returns of selected pharma stocks fluctuates around zero which indicates mixed market reactions related to USFDA approvals. In case of stocks of Sunpharma, Cipla and Biocon have notable positive AAR on specific days pre and post event day. On other side, stocks of Dr. Reddy's, Cadila and Aurobindo have negative AAR showing less favorable market due to event. Overall, we can say that

no single stock has outperformed or underperformed so it can give abnormal gain or loss to investors of pharma stocks but not significant one. Thus, USFDA announcements are not having significant impact on stock prices at 5% significance but have notable impact on stock prices at 10% significance so null hypothesis is being accepted.

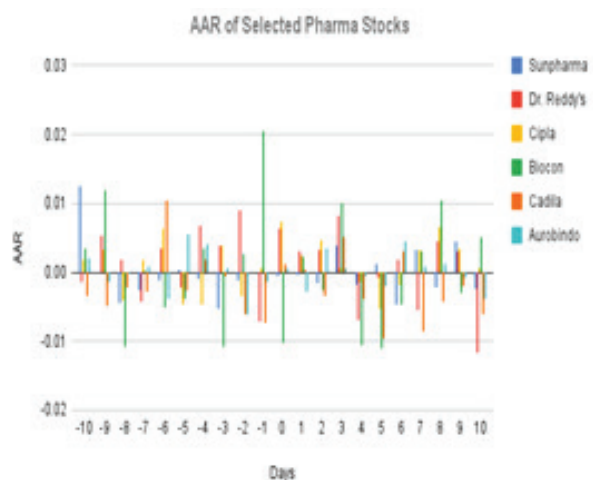


Fig. 1. AAR of Selected Pharma stocks

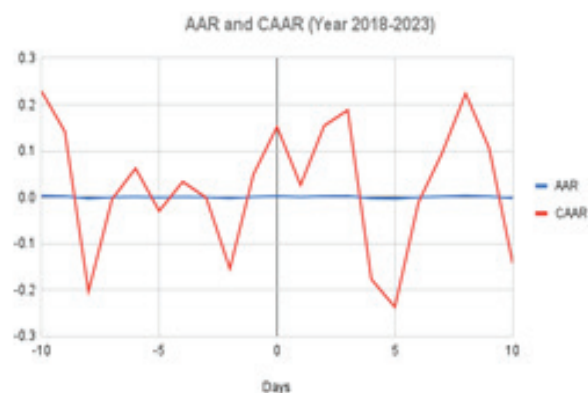


Fig. 2. AAR and CAAR from year 2018-2023

Figure II represents AAR and CAAR of selected six pharmaceutical companies over 21 days ranging from -10 days to +10 days.

Cumulative average abnormal return shows notable fluctuations particularly in pre-event window with both positive and negative returns. Before the day of USFDA approval, decline in CAAR indicates the negative sentiments for the event, further leading to mixed market reactions and investors' sentiments after happening of the event. This shows semi-strong efficiency of market.

CONCLUSION

The study reveals that there is no significant impact of USFDA approval on daily stock prices rather it has long term and aggregate but mixed impact (positive as well as negative) on pharma stocks. Hence, market takes a long term to incorporate information related to USFDA approvals and this shows semi-strong form of market efficiency. However, this study concludes for the impact of USFDA approval on stock prices but there are other variables like volume, depth and liquidity which can be explored with longer time horizon, event window and companies for further research.

LIMITATION

Results of event study are specially being affected by confounding events and heteroskedasticity so it should be addressed while conducting a study but at the same time this affects inclusion of pharmaceutical companies in sample of the study.

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Applying Authorization in SDN-IDS using an Optimal Exponential Isogeny Diffie Hellman-based Digital Signature Algorithm (EIDH-DSA)

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ABSTRACT

This paper proposes a novel framework for Authorization in Soft-ware Defined Network Intrusion Detection System using an Optimal Exponential Isogeny Diffie Hellman-Based Digital Signature Algorithm (EIDH-DSA). The system initiates user registration, generates public and private keys, and creates a QR Code incorporating user details. The QR Code is then uploaded to an interplanetary file system (IPFS) server, and its Hash code is sent to registered users, the SDN Switch layer, and the Controller Layer. Users log in using username, password, and QR Code, digitally signing the IPFS server's Hash code with Exponential Isogeny Diffie Hellman-based Digital Signature Algorithm. A secret, generated through Exponential Isogeny Diffie Hellman, enhances the digital signature creation. This signed signature is verified in the switch layer before executing requested tasks from mobile users, ensuring a secure authorization for SDN based intrusion detection system. Our experiment uses Mininet SDN tool in Ubuntu as a testbed.

KEYWORDS: *IPFS, SDN, IDS, Exponential Isogeny Diffie Hellman, Hash code, Control layer, verification.*

INTRODUCTION

Software Defined Networking (SDN) revolutionizes network management by separating control (intelligence) from data forwarding. This centralized control allows for programmatic configuration, increased agility, improved network visibility, and open standards for flexibility and innovation. SDN offers reduced costs, enhanced security, scalability, and improved application performance, making it ideal for data center automation, cloud networking, security automation, and managing complex IoT networks. AI-powered network optimization gives engineers a real-time, holistic view of network health, including traffic, response times, and service status. This permits programmed adjustments to keep your network running smoothly [1]. However, SDN also has restrictions like budding performance overhead and evolving standards. SDN is considered a more light-footed and concentrated way to deal with network control, creating some distance from equipment reliance [2]. SDN's incorporated control, programmability, and open engineering are

significant stages toward a beneficial deft, secure, and effective systems administration future.

Software Defined Networks (SDN) present unique security challenges due to their centralized control. Intrusion Detection Systems (IDS) become even more critical in this environment. SDN's centralized view of the network allows the IDS to analyze traffic broadly, while the programmable nature

of SDN aids the IDS to trigger dynamic responses like separating compromised devices or reconfiguring firewall rules all in real-time for faster and more effective security. Network intrusion detection system is a vital fragment of network safety research and also as a transition from traditional networks to SDNs. Even though the conventional network is dominant over the SDN, it still requires huge attention to progress the safety of SDN. Software-defined networking (SDN) grants a standard swing in information center administration by decoupling the control plane from the fundamental forwarding hardware. This innovative

architecture empowers network administrators with enhanced flexibility and programmability through its well-defined three-tier structure: the centralized control plane (often referred to as the controller), and the data plane further segmented into northbound and southbound interfaces [4]. SDN (Software-Defined Networking) boasts a exclusive construction that splits the control plane from the data plane, offering greater flexibility and programmability compared to traditional networks. Fig.1 shows the breakdown of its key components: Control Plane (Controller): Often referred to as the brain of the SDN network, the controller is a software solicitation accountable aimed at network-wide decisions. It characterizes traffic stream arrangements, designs network devices, and screens by and large organization security. The controller speaks with the information plane utilizing southward APIs (e.g., Open-Flow).

Data Plane (Switches and Routers): These organization gadgets handle the genuine sending of information parcels in light of guidelines obtained from the controller. Not at all like conventional organizations where they settle on autonomous directing choices, SDN switches go about as smart sending components. The information plane imparts strategy updates and organization data back to the controller utilizing northward APIs.

Applications: SDN allows for the development and deployment of network applications on top of the controller. These applications can leverage the network's programmability to perform various functions like security policy enforcement, load balancing, and traffic optimization. Leveraging SDN's programmability, a controller application can be deployed to identify and moderate low-rate DDoS attacks. This application harnesses machine learning and deep learning techniques to create robust defense mechanisms, providing a software- defined approach to combating these threats [3], which implies that the controller is a very significant component of SDN. Machine Learning and Deep Learning can solve several security problems but still, there is a huge scope for improvement. Vulnerabilities in the SDN control plane operating system provide a comprehensive sight of the network to the applications running on top in which the intruder can grab the centralized control. Other issues include authentication authorization, access control,

etc. Beyond the technical aspects, securing access requires robust mechanisms for user authentication, authorization, and access control. In this paper, first will introduce Intrusion detection in Software-defined networks, and then we propose an Optimal method that focuses on authorization using the Exponential Isogeny Diffie Hellman method. The main aim of this paper is to architect a novel framework for a Resilient Intrusion Detection System for an Authorized Software Defined Network using EDH-DSA. After successful verification of the user only, the requested task by the mobile users will be sent to Switches.

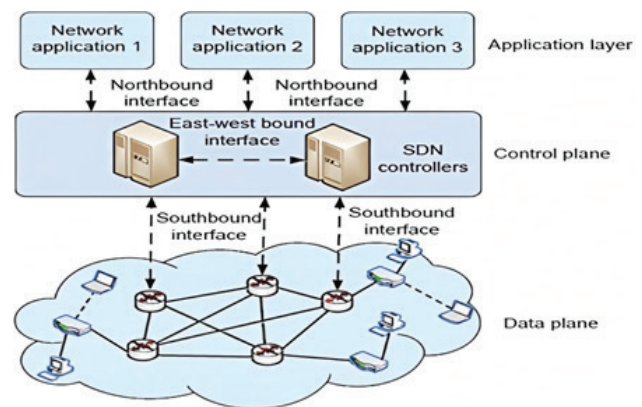


Fig. 1. Software-Defined Networks Architecture

RELATED WORK

In [5] the authors present a novel access control system designed as a controller application for Software-Defined Networking (SDN) environments. The system focuses on host identity verification upon connection attempts. Our mechanism effectively deters unauthorized access and assigns appropriate privilege levels based on a host's authenticated credentials. Notably, this approach leverages a POX controller for implementation, eliminating the need for additional protocols or host/router configurations, and promoting seamless integration within existing SDN infrastructure. Work in [11] [13] presents a novel two-tiered architecture for compromised device identification within an Internet of Things (IoT) network. The first-tier leverages routers as edge devices, responsible for user validation using RFID tags and encrypted signatures. Authentic user data packets are formerly forwarded to the subsequent tier, comprised of switches equipped with type-II fuzzy filtering for basic packet validation.

Crucial features are mined on or after the packets and categorized as normal, suspicious, or malicious. Packets identified as mismatched are directed to controllers for auxiliary analysis. These controllers maintain separate queues for suspicious and normal traffic. Deep learning models deployed within the controllers then classify and predict the nature of suspicious packets, enabling advanced threat detection. The proposed system has been evaluated in an OMNeT++ environment, demonstrating its efficiency in terms of different intruder detection parameters. Authors in [6] proposed and instigated SDN-RBAC, a recognized role-based access control model for Software-Defined Networking (SDN) applications. SDN-RBAC enforces the value of least privilege at the application and session level, mitigating risks associated with compromised, buggy, or malicious applications. The model also explores various approaches for managing application sessions, minimizing the network attack surface in such scenarios. They demonstrate the effectiveness of SDN-RBAC through a proof-of-concept prototype implemented on the Floodlight controller. This prototype utilizes hooking techniques to enforce security policies without modifying the Floodlight framework itself. The implementation successfully verifies the model's usability and effectiveness in identifying application sessions and rejecting unauthorized access attempts by controller applications in real time. Authors in [15] describe an authentication algorithm implemented within the SDN gateway to verify the legitimacy of fog nodes. To minimize the computational burden on IoT devices, the protocol only imposes sending privacy and functional attributes to the SDN gateway. This approach significantly reduces the processing demands placed on resource-constrained IoT devices. An new system, leveraging the POX controller and Mininet emulator, validates the efficacy and practicality of our proposed scheme. The results demonstrate that compared to existing solutions, our method offers improved efficiency. Notably, the computational overhead ($2nTm$) and storage above $((n+2)1024+256)$ were evidently lower [15] offering a complete review of present Authentication, Authorization, and Accountability (AAA) approaches for smart grids, categorized by key characteristics. Building upon this analysis, they propose 3AS, an extension of the

ARES framework. This extension incorporates a robust security component built on the IEEE 802.1X standard. Executed on the Ryu SDN controller then assessed proceeding a simulated environment, 3AS demonstrates successful authorization, authentication and accountability functionalities by minimal control weight and interruption. These findings highlight the suitability of 3AS for real-world deployment across various smart grid applications. Authors in [8] suggests a approach for encompassing SDN abilities through convention procedures. These procedures permit fine-grained, user-defined permissions specifically tailored for access control administration in Software-Defined Networks (SDNs). Leveraging these custom functionalities, they presented an SDN-RBAC, administrative model that meticulously succeeds access control actions and defines network application permissions. They also verify the suitability and efficiency of convention consents through a proof-of-concept model and demonstrative use cases. The output reveals how convention permissions authorize administrators with a more granular and efficient method to contact control management within SDN settings. The study in [9] discovers a innovative two-factor authentication (2FA) technique for securing Internet of Things (IoT) networks in smart city settings. It exploits a centralized SDN (Software-Defined Networking) method for network management and influences a unique OTP (One-Time Password) generation technique based on two constraints. This combination offers a inconsequential and flexible authentication and authorization solution for the IoT network. Article [15] presents a critical investigation of the cryptographic protocol proposed by M. Alotaibi. In which they recognize potential security weaknesses and demonstrate a possible attack manipulating these vulnerabilities. To address these security apprehensions, they proposed a new protocol leveraging the Elliptic Curve Diffie-Hellman (ECDH) to attain shared authentication and secure key procedure. Their resolution is implemented and tested using the Scyther tool, surveyed by a manual security evaluation to ensure its robustness. They also compared their ECDH-based protocol with existing methods, highlighting its enhanced security posture. Authors in [10] [12] suggest an innovative secure network architecture for the Internet of Things (IoT)

called ID-based SDN (IBSDN). Unlike traditional SDN solutions, IBSDN focuses on providing inherent network-level trust for IoT devices. It achieves this by embedding unique and unforgeable device identities directly within the data stream. A key innovation is the Group Commander role, which centralizes member authentication control. Elliptic Curve Diffie-Hellman Key Exchange (ECDHKE) establishes secure shared keys for encrypting routing data. Rigorous security analysis using AVISPA validates GSAKA-ECDHKE's effectiveness against Man-in-the-Middle, replay, and Denial-of-Service attacks, demonstrating its suitability for secure military group communication over 4G networks. Authors in [14] delve into Diffie-Hellman key exchange, a cryptographic technique that holds promise for bolstering the security and privacy of ad-hoc networks. Unlike traditional public key cryptography like RSA, Diffie-Hellman allows secure key establishment over insecure channels, a crucial aspect for dynamic and untrusted environments like ad-hoc networks. They also explore how Diffie-Hellman can be leveraged to create shared secret keys between devices in an ad-hoc network, facilitating secure communication without pre-distributed keys.

PROPOSED METHOD

The data plane comprises of dump policies, and its accountability is towards transfer of packets based on control plane results. Considering these things, the proposed system will be developed. As shown in Fig.2, the proposed system will start with the mobile users. At first, all the mobile users must be registered with the server using their personal information and device details. At that time, the public key and private key will be generated from the key generation center. Next, the mobile user's public key, MAC Address, and private key will be combined, and a QR Code will be generated. After that, this QR Code will be uploaded to the IPFS server. Next, this server generates the Hash code and sends it to the registered mobile user, SDN Switch layer, and Controller Layer. After successful registration of users, they must log login with the server using a username, password, and QR Code. During login time, the user must digitally sign the Hash code from the IPFS server using their private key with the help of Exponential Isogeny Diffie Hellman-based Digital Signature Algorithm. Here, to improve the

digital signature creation process, the secret will be generated using Exponential Isogeny Diffie Hellman and this will be used in the Digital Signature Algorithm. Next, this digitally signed signature will be verified in the switch layer. After successful verification of the user only, the requested task by the mobile users will be sent to Switches.

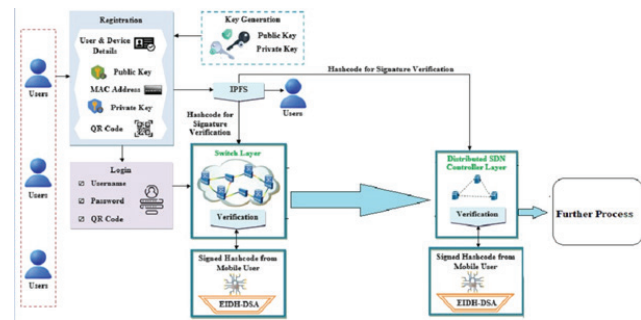


Fig. 2. Proposed Model with Isogeny Diffie Hellman-based Digital Signature Algorithm (EIDH-DSA)

Algorithm 1: User Authentication and Key Agreement

Data: User details, device information

Result: Establishment of secure communication

Registration Phase:

- Step 1.1: Register user details and device information;
- Step 1.2: Generate unique public key K_{pub} for user;
- Step 1.3: Generate corresponding private key K_{priv} for user;

Login Phase:

- Step 2.1: User enters username and password;

QR Code Generation:

- Step 3.1: Generate QR code containing username and password;

User Authentication:

- Step 4.1: User scans QR code with device;
- Step 4.2: Network retrieves username and password;
- Step 4.3: Network verifies username and password;

Key Agreement (if authentication is successful):

- Step 5.1: Network generates random private key K_{rand} ;
- Step 5.2: Network derives public key K_{pub} from K_{rand} ;
- Step 5.3: Network transmits K_{pub} to user's device;
- Step 5.4: User's device calculates shared secret key using K_{pub} and K_{priv} ;

Step 5.5: Network calculates shared secret key using K_{pub} and K_{rand} ;

Signed Hash code Exchange:

Step 6.1: User's device generates hash code;

Step 6.2: User's device signs hash code;

Step 6.3: Network generates hash code;

Step 6.4: Network signs hash code;

Step 6.5: User's device transmits signed hash code;

Step 6.6: Network transmits signed hash code;

Verification:

Step 7.1: User's device verifies network's signed hash code;

Step 7.2: Network verifies user's device's signed hash code;

Secure Communication (if verification is successful):

Step 8.1: Establish trust between the user's device and network;

Step 8.2: Establish secure communication channel;

wherever an invader interrupts and operates the key conversation. To address this, DH is often combined with other mechanisms like digital signatures for secure communication. Exponential Isogeny Diffie-Hellman (EIDH) is a cryptographic protocol founded on elliptic curves that enables two parties to securely establish a common secret key over an apprehensive communication network. Each party produces a private key and calculates a corresponding public key on the elliptic curve. Isogenies, which are rational maps preserving the group structure between elliptic curves, are then used to establish a relationship between the parties' public keys, consequential in a shared secret curve. This shared secret can be applied for subsequent cryptographic operations, ensuring secure communication between the parties. EIDH provides resistance against attacks from quantum computers, making it a robust solution for key exchange in cryptographic protocols.

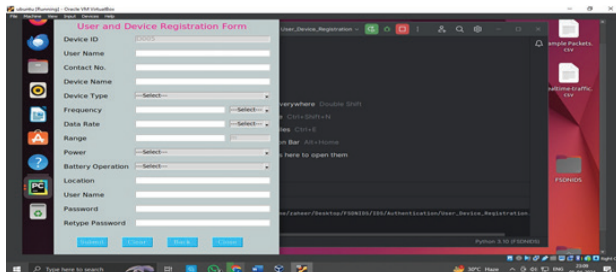


Fig. 3. Step 1: Registration of the User

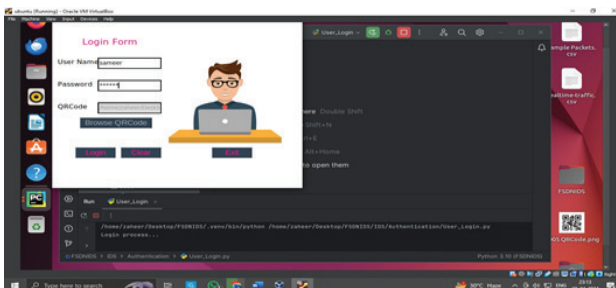


Fig. 4. User Login Using Credentials and QR Code

RESULTS AND DISCUSSIONS

Cryptography safeguards communication by certifying confidentiality, integrity, and authentication. Diffie-Hellman key exchange enables shared secret key creation but is vulnerable to Man-in-the-Middle attacks

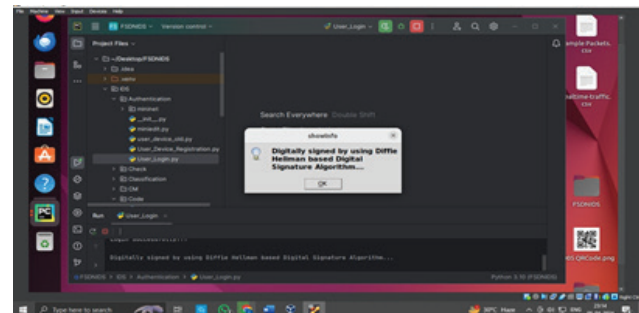


Fig. 5. EIDH Cryptographic Algorithm used to Login

- **Elliptic Curves:** Let E/F_p be an elliptic curve defined over a finite field F_p
- **Key Generation:** Each party A and B generates a private key d_A, d_B respectively. The corresponding public keys P_A, P_B are computed as follows: $P_A = [d_A]G, P_B = [d_B]G$ where G is a base point on the elliptic curve.
- **Isogeny Calculation:** An isogeny ϕ between elliptic curves E and E' is determined by its kernel: $\ker(\phi) = \{P \in E : \phi(P) = O\}$ where O is the point at infinity.
- **Key Exchange:** Once the public keys are exchanged, each party computes an isogeny from their private key to the other party's public key. For example, party A computes an isogeny ϕ_A from E to E' using their private key d_A and party B's public key P_B .

Similarly, party B computes an isogeny ϕ_B from E to E' using their private key d_B and party A's public key PA .

- **Shared Secret:** The shared secret is derived from the isogeny ϕ , which defines a new elliptic curve E' . This shared secret can be used for subsequent cryptographic operations, such as encryption or digital signatures.

CONCLUSION

The SDN controller arises as the central system of the Software-Defined Networking architecture and its role in policy definition, network device configuration, and overall strength monitoring empowers network administrators with unprecedented flexibility and control. This paper presents a novel framework for a Resilient Intrusion Detection System precisely intended for authorized Software-Defined Networks (SDNs). The proposed method influences EDH-DSA cryptography to establish a secure user authentication process using digital signatures and QR codes stored on an IPFS server. This multi-layered approach ensures message integrity and user validity before yielding access to network resources, enhancing the SDN's inherent resilience against unauthorized access and intrusion attempts which is implemented using the SDN Mininet tool in Ubuntu.

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Exploring Pathways of Work Motivation and Performance: A Bibliometric and Content Analysis

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ABSTRACT

This study employs multidimensional bibliometric analysis using tools such as Vosviewer, Biblioshiny, and the Dimensions database to map the intellectual contours of work motivation and performance research. Focusing on seminal authors and theories, the study aims to unveil emergent topics and influence both academic discourse and practical applications in Human Resources and Organizational Behaviour. The metrics utilised include citation analysis, co-citation, and thematic clustering to identify high-impact studies and advance field-specific knowledge.

KEYWORDS: *Motivation, Performance, Bibliometric analysis, Content analysis.*

INTRODUCTION

The interplay between motivation and performance in organizational settings serves as a thread that strings employee well-being, productivity, and organizational success [1]. Although the importance of various constructs and the theoretical framework are well acknowledged, a comprehensive understanding of the academic landscape remains fragmented [2]. Motivation and performance serve as pivotal constructs in the complex ecosystem of organizational behaviour. Despite its importance, scholarly consensus remains fragmented, necessitating a methodologically robust bibliometric study to provide an intellectual map of the field [3]. This study identifies the limitations of traditional literature reviews and advocates for bibliometric methods that offer a more nuanced data-driven overview [4]. Critically examined theories include the self-determination theory, goal-setting theory, and job characteristics model [5] [6]. While pivotal, these theories face ongoing scrutiny and evolution, emphasising the complexity and dynamism of the field. Using bibliometric analysis, this study provides a structured overview of this field, serving as a navigational aid for future research.

Data were extracted from the Dimensions database and analysed using VOSviewer and Biblioshiny for

co-citations, references, and thematic clusters. This study addresses four research questions, delving into the evolution of theories, intellectual mapping, pivotal authors, and emerging trends, thereby enhancing the scope and rigor of the study compared with traditional narrative literature reviews [4].

METHODOLOGY

The foundation of this bibliometric study is built upon seminal works in the field, including the paper by Leydesdorff [7] on the measurement of “betweenness centrality” as a resonance indicator and a new bibliometric approach to research quality in higher education. VOSviewer [8] was used to visualise complex bibliometric networks, including co-citation and co-authorship networks. In addition, Biblioshiny, an R-based application, was used because of its user-friendly interface and ability [9] to perform advanced statistical analyses. By integrating these diverse metrics—citation counts, co-citation analysis, and text analysis of abstracts—this study aims to offer a multidimensional view of the scholarly impact and thematic evolution of the field under study.

Dimensions were chosen over other databases because of its superior capabilities in offering a more extensive dataset, thereby aligning with the study’s aim of conducting a comprehensive bibliometric analysis. The

Dimensions database provides access to a wide range of scholarly articles, patents, and grants, making it a robust platform for bibliometric analysis [10].

Search Criteria and Time Frame: Rationale Behind Methodological Choices

The search criteria were carefully selected to align with the study objectives. The timeframe for the extracted data was set to capture the most current state of the field as of 2 May 2023 thereby ensuring the study's timeliness and relevance. The search string used was as follows.

"(('Work Motivation') OR ('Job Motivation') OR ('Employee Motivation') OR ('Career Motivation')) AND (('Performance') OR ('Work Performance') OR ('Task Performance') OR ('Job Performance') OR ('Individual Performance'))"

Table 1. Search Criteria and Data Breakdown

Search Criteria	"Work Motivation and Performance" string
Total Articles	95,973
Filtered by Title and Abstract	5,054
Final Data downloaded from Dimensions	2,500

The initial search yielded 95,973 articles highlighting the academic importance of work motivation and performance. Refining the search to titles and abstracts produced a focused corpus of 5,054 articles. The final dataset was limited to 2,500 articles owing to the download capacity of the dimensions, as shown in Table I. This selection is considered adequate for rigorous co-citation coupling analysis to scrutinise bibliographic references and align well with the intended bibliometric and content analysis objectives.

Research Questions

This study examined the complex landscape of work motivation and performance through three targeted research questions designed to explore the key dimensions and interrelations within the field.

1. RQ1: How does the temporal variation in the number of articles in the database reflect evolving

research priorities and focus within the field of work motivation and performance?

2. RQ2: What insights do co-citation clusters of authors provide into intellectual groupings and interdisciplinary linkages within the field?
3. RQ3: How do the co-citation clusters of academic journals in "work motivation and performance" reflect differences in focus, methodological rigor, and contributions to theory and practice?

FINDINGS

The findings were meticulously organised into three distinct sub-headings, each corresponding to one of the three targeted research questions that collectively spanned the entire domain of work motivation and performance.

Publication Productivity

To answer RQ1, that is, how does the temporal variation in the number of articles in the database reflect the evolving research priorities and focus?

As shown in Table II, data collected from the Dimensions database reveals a research landscape that stretches from 1969 to 2023, showcasing a dynamically evolving field with robust characteristics. With a substantial corpus of 2,500 documents and an annual growth rate of 7.64%, the field exemplifies the "Law of Accelerating Returns", which posits that evolutionary systems tend to grow exponentially [11]. The relatively young average age of documents at 4.71 years and an average citation rate of 7.51 per document point towards ongoing relevance and impact, aligning with Garfield's theory of "Citation Indexing" [12].

Table 2. Production Output of the Dimensions Database

Description	Results
Timespan	1969:2023
Sources (Journals, Books, etc)	1.00
Documents	2500.00
Annual Growth Rate %	7.64
Document Average Age	4.71 years
Average citations per doc	7.51
Authors	5045.00
Authors of single-authored docs	601.00

Single-authored docs	635.00
Co-Authors per Doc	2.36
article	2500.00

led by Arnold Bakker and Evangelia Demerouti's Job Demands-Resources model and Wilmar Schaufeli's research on burnout.

Table 3. Three clusters observed in co-citation network

Fig. 1. Indicating total output spanning 1969:2023

As illustrated in Figure II, the data exhibit a strong alignment with Lotka’s law in bibliometrics, indicating that the majority of authors (4,474) contributed only a single paper, forming the ‘long tail’ of the distribution.

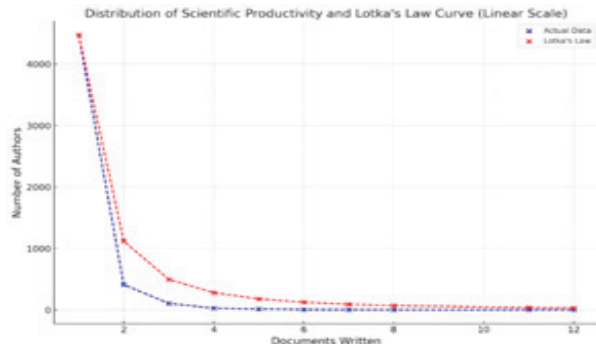


Fig. 2. Alignment of author data with the Lotka's law

Most Influential Authors

Using co-citation coupling techniques on a 29,718-author dataset, ten authors with significant scholarly impact were identified, forming three distinct research clusters. Cluster 1 focuses on goal-setting theories and organizational behaviour, significantly shaped by Edwin Locke. Cluster 2 is anchored in Self-Determination Theory (SDT), with Edward Deci's seminal work and Marylène Gagné's contributions on autonomy-supportive practices as key influences. The third cluster centers on occupational health psychology,

Serial	Author	Cluster
1	Locke, Edwin A.	1
2	Latham, Gary P.	1
3	Judge, Timothy A.	1
4	Austin, Stéphanie	2
5	Chemolli, Emanuela	2
6	Deci, Edward L.	2
7	Demerouti, Evangelia	3
8	Podsakoff, Nathan P.	3
9	Schaufeli, Wilmar B.	3
10	Sonnentag, Sabine	3

Most Influential Journals

Upon scrutiny of the data, three distinct cluster formations emerged, as shown in Figure III. In a thematic categorisation of academic journals, Cluster 1 primarily concentrates on applied psychology and management. Cluster 2, is distinguished for its rigorous peer-review process and serves as a repository for foundational theories. Lastly, Cluster 3 encompasses interdisciplinary journals, such as the “Academy of Management Review” and “Public Administration Review”, which aim to bridge theory and practice either by synthesising existing research or critiquing established frameworks. The ten Key journals in the three co-citation clusters are listed in Table IV.

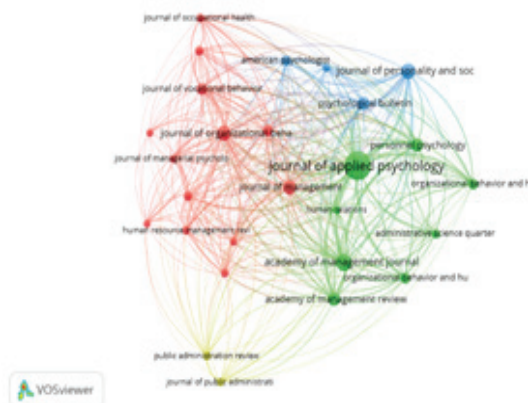


Figure 3. Co-Citation coupling analysis of Journals

Table 4. Ten Key journals in the three co-citation clusters

Ser.	Source (Publications)	Cluster
1	European journal of work and organizational psychology	1
2	Human relations	1
3	Human resource management review	1
4	Academy of management journal	2
5	Administrative science quarterly	2
6	American psychologist	2
7	Annual review of psychology	2
8	Academy of management review	3
9	Journal of public administration research and theory	3
10	Public administration review	3

CONCLUSION

The analysis of publication productivity (RQ1) revealed a phased evolution in scholarly output, peaking in 2022. This trend highlights a dynamic research landscape, with a subset of highly productive authors driving academic competitiveness.

Intellectual clustering (RQ2) revealed three foundational theories central to this domain: self-determination theory, goal-setting theory, and the job demand–job characteristic model.

The exploration of journal clustering (RQ3) demonstrates distinct groupings based on research orientation and contributions. These clusters offer a practical framework for researchers to target their works within specific journal typologies.

In sum, this study provides a nuanced perspective on the field's development, identifies key inflection points, and guides future enquiry in work motivation and performance research.

Limitations of the Database

While the dimensions database was insightful, future studies could use more expansive databases, such as Scopus and Web of Science, for richer analysis. Furthermore, the Dimensions database provided a limited sample of 2,500 publications out of a total of 5,013 available publications owing to database constraints. Given this context, a sample size of 2,500

is not only statistically significant but also practically sufficient for capturing the nuances and dynamics of the research landscape.

Summary and Key Takeaways

In summary, a 55-year scope provides a comprehensive, statistically robust, and contextually rich dataset that is well suited for advanced bibliometric analyses aimed at understanding the complexities and evolution of a research field. This is timely given current workplace challenges, such as remote work conditions, and would add depth to our understanding of work motivation and performance.

Recommendations for Future Research

Given the need to address contemporary challenges in the workplace, such as challenging working conditions, the following research questions can guide future scholarly enquiry.

1. Theory framework integration: How can the integration of SDT, Goal Setting Theory, and the Job Demand-Job Characteristic Model provide a more comprehensive understanding of work motivation and performance?
2. Database Utilisation: What insights can be gained by employing comprehensive databases, such as Scopus and Web of Science, for bibliometric analysis in this domain?
3. Environmental Mediators: How do organizational and environmental factors mediate or modify the effectiveness of intrinsic motivation and goal-oriented behaviours?

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I4.0 and Reskilling Requirements of Marketing Personnel

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ABSTRACT

Reskilling marketing personnel is crucial for thriving in the I4.0-powered competitive business arena. Hence, the study aims to explore the significance of reskilling marketing personnel in the I4.0 evolution. In this regard, the paper has two research objectives: (i) to recognise the significant skills required by marketing personnel while combating the I4.0 transition in marketing and (ii) to discover the benefits and challenges associated with developing these skills in marketing themes. The methodology incorporates a qualitative approach, and secondary data is collected using a thorough survey of existing academic literature on I4.0 technologies in marketing and skills required by marketing teams to deploy I4.0. The results indicate the most sought human skills for optimising I4.0 technologies in marketing.

KEYWORDS: I4.0, Digital marketing, Big data analysis, Content creation, SEO, Marketing automation.

INTRODUCTION

In the Industry 4.0 equation, technology and human skills hold equal halves. The most significant element of the fourth industrial revolution (I4.0) is digitalisation, which enables human beings to connect with technology. The enabling technologies of I4.0 include the Internet of Things (IoT), big data analytics, cloud computing, augmented reality, advanced robotics, additive manufacturing, horizontal/vertical integration, cyber-security, and simulation. Given that human skills are equally crucial as technology, companies must ensure that their workforce is adequately equipped with the skills needed to thrive in the 4IR. In this regard, companies must either reskill or upskill their employees or sometimes even hire new talents based on requirements. Upskilling refers to learning new skills that enable an employee to evolve in the current position. In contrast, reskilling refers to retraining employees with new skill sets, allowing them to fill different company designations.

I4.0 technologies have a profound impact on the marketing activities of business entities. Unlike traditional marketing, internet-based communication enables customers to interact with each other about their opinions and feedback about a product. Under I4.0, marketing integrates both online and offline customer-company communications to build strong relationships that are crucial for improving business performance. Marketing experts harness various digital technologies of I4.0 to realise their marketing objectives. Interestingly, prominent information processing technologies like artificial intelligence (AI), big data analytics, cloud computing, customer profiling, and the Internet of Things (IoT) enable companies to achieve competitive advantage through better market positioning [2] and creating possibilities to transform their marketing practices to meet changing customer expectations. Modern tools like machine automation solutions, chatbots, and virtual assistants serve this purpose, facilitating personalised communications and content delivery [3]. However, the effective deployment

of these advancements demands companies to improve their expertise in these areas, necessitating marketing professionals to acquire the required competence and skills.

Research objectives:

- What skills do marketing personnel require to combat the I4.0 transition in marketing?
- What are the benefits and challenges associated with it?

METHODOLOGY

The study adopts a qualitative research design to address the research questions. Much research has been carried out to learn about Industry 4.0 technologies and their impact on marketing. So far, very few studies have researched the required skills associated with utilising I4.0 in business. Therefore, the current research centres on an exclusive exploration of the human competencies marketing professionals require to use I4.0 to generate their marketing ideas.

PROMINENT SKILLS REQUIRED BY MARKETING PROFESSIONALS TO USE I4.0 IN MARKETING

Content creation: Valuable content wins business. Authors in [9] propounded that the content which functions optimally for companies must be authentic, relevant, entertaining, helpful, and timely; hence, the content must be interesting to capture the attention of people in this busy world. Therefore, marketing teams must enhance their content creation capacities to include multiple content in a consistent manner.

Creativity: Qualitative research carried out by investigators in [8] reveals that companies can efficiently increase product sales, customer conversions, and website traffic by enhancing creativity in their digital marketing strategy. The findings also show that creativity is instrumental in driving customer attention through compelling messages conveying fresh ideas, captivating user experiences, and engaging content.

Storytelling: While people suffer information overload due to the vast availability of online content, companies face the massive challenge of grabbing customers' attention. Investigators in [7] propounded brand storytelling as an efficient method to differentiate a brand

amidst abundant content. They also indicated five critical elements for delivering influential stories: leveraging AI technology, making a comprehensive analysis of the target audience, designing narratives suiting individual preferences, using multiple communication channels, and encouraging active customer participation.

Big data analytics: Since today's marketing phenomenon is totally data-driven, marketing professionals must be proficient in the big data concept to analyse hidden patterns in customer behaviours and make meaningful interpretations from their personal data [4]. Besides, the big data analysis skill will enhance the personalisation of customer experiences [7].

Search engine optimisation (SEO): Marketers conversant with SEO skills can help organisations increase their website traffic by improving their online visibility. Creating quality content and using relevant keywords are considered the main factors influencing web page rankings in search results, directly affecting the purchasing decisions of customers.

Social media marketing skills: According to Statista, among the 5.52 billion internet users in the world, 5.22 billion people are social media users, attributing to 63.8% of the total world population [10]. Forbes' findings in [11] denote that businesses must exploit social media because their competitors already exist online, and late entry will create a big gap to catch up with; sometimes, there is no competition in social media that would make a wide gap for the competitors to catch up with.

Email marketing: Emails with low levels of persuasive messages are more likely to be opened; however, those with higher levels of persuasive messages are more likely to lower cart abandonment [12]. Hence, marketing personnel with efficient email marketing skills will know the relevance of the kind of email to a particular scenario, which can make sales conversions.

Marketing automation: The focus of marketing automation is an automatic "personalisation" or "customisation" of marketing mix functions that has its origins in the business-to-business (B2B) field [13]. Researchers in [15] have shown seven prime factors that companies must consider throughout the marketing automation process: (i) readiness of relevant expertise and human resources; (ii) evaluating and updating novel

business processes; (iii) properly defining the scope of the implementation project; (iv) securing support from key stakeholders; (v) developing customer-focused content; (vi) sustained capital funding; and (vii) setting realistic expectations.

Analytical and critical reasoning: Marketers must possess the analytical skills to understand customer behaviour and craft narratives that fit customer preferences [7]. Authors in [5] have also identified creative and critical thinking as essential skills in the I4.0 evolution.

BENEFITS

I4.0 skills enable marketers to get a 360-degree view of consumers' patterns and behaviours, allowing them to craft customer-specific content and enhance their brand recall and recognition both in-store and online. Companies can reduce costs and optimise performance by leveraging their marketing professionals' ability to harness real-time marketing data. Companies can improve their marketing performance by efficiently implementing I4.0, which in turn enhances customer loyalty and increases product customisation [6]. Delivering creative content with solid storylines and robust visual art will create an impactful trace in the customer's minds, enabling them to recall the brand. People paid noticeable attention and had positive attitudes towards compelling stories and appealing visual designs in advertising. Besides, companies with such skilled employees can quickly craft influential and unique advertisements relevant to different cultural and demographic groups. Entrepreneurial creativity is an indispensable skill sought by entrepreneurs that helps them create new ideas or modify existing ones required to run their businesses [8]. The email marketing strategy will be more helpful in acquiring new customers and retaining existing customers. Marketing automation competence draws customer attention and enhances their involvement in the brands' communicated message due to its relevance [13] and enables companies to elevate conversion rate, retention rate, and cross-and up-selling.

CHALLENGES

These emerging technologies create irreversible job market shifts, which pose significant challenges for companies and policymakers in acquiring relevant

skills and creating sufficient employment opportunities [1]. Companies must take timely actions to equip their workforce with needed skills since I4.0 technologies are broadly embraced everywhere [5]. The emerging digital skills and the role of AI pose severe obstacles to building next-generation marketing teams. A significant skills gap arises from the difficulty of merging digital skills with emerging marketing approaches. The study also found skills gaps that daunt the communication industry, including the absence of specific technical skills, insufficiency of intelligent futureproofing facilitating dynamic technological change and development, and requirement of best practice guidance on performance metrics. Another major hurdle identified by [14] is combining content marketing with B2B selling processes through marketing automation strategies to achieve business benefits. Hence, organisations need help to produce premium content fostering brand loyalty, and running robust advertising campaigns grounded in relationship marketing poses a significant challenge. Hence, reskilling employees to develop timely and valuable content blended with existing marketing and selling processes can be attributed to a common complication companies face in the I4.0 progression.

CONCLUSION

I4.0 technologies have necessitated companies to ensure that their marketing strategies align with these technological advancements to address customer needs efficiently. It has become mandatory for companies to do online advertising to build their brand image and increase traffic to succeed in the competitive business environment. Marketing is data-driven in the I4.0 era. An efficient marketing professional must be able to draft marketing strategies capable of tapping into previously unreachable markets constrained due to time, geographical distances, or communication methods. The study discovers that research in this area is budding, and an absence of literature is explicitly found in various marketing skills relevant to the I4.0 era discussed in this paper, calling for extensive empirical and non-empirical qualitative and quantitative research in this context.

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Micro Small and Medium Enterprises (MSMEs) in Aspirational Districts of Sixth Schedule Areas of Assam

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ABSTRACT

The present study examines the growth of Micro Small and Medium Enterprises (MSME) before and after implementing the Aspirational District Programme (ADP). The type of MSME that mostly appeared in the study area after ADP and the relationship between the type of MSME and the Social Category of Owners are also examined. The Aspirational Districts of Assam's Sixth Schedule Areas have been considered for this study; both a primary and secondary data have also been considered. According to the findings, micro-enterprises make up the majority of MSME in the study area; the MSME have grown significantly over the period, reaching 12.3% annually; and, there is a significant relation between the "Social Category of Owners and type of MSME" and "Social Category of Owners and nature of MSME." Furthermore, it was found that over two-fifths of the MSME in the research area is owned by Scheduled Tribes (ST).

KEYWORDS: MSME, Aspirational Districts, Aspirational District Programme, Sixth Schedule Area.

INTRODUCTION

Micro, Small, and Medium Enterprises (MSME) play a significant role in employment generation and economic growth in any country irrespective of developed or developing countries. The role of MSME in the Indian economy is highly significant as its share of contribution to the country's GDP is about 30%. The MSME sector also accounts for more than one-third of India's total manufacturing output. According to the Directorate General of Commercial Intelligence and Statistics (DGCIS), the manufacturing output share of MSME across all manufacturing output in India grew from 36.6% in 2019–20 to 36.9% in 2021–22 and then to 36.2% in 2022–23. However, the contribution of medium enterprises is significantly lower than that of micro and small enterprises. The micro and small enterprises make up the majority of the contribution in terms of number of enterprises as well as employment. All of the North Eastern Indian states present the same image. In India, there were over 30 million MSME registered as of December 2023. Promoting the MSME sector is crucial due to its distinct role in industrialization, as well as its contribution to export promotion and job

creation. This sector creates a platform for new ideas and new business units where people of all ages can enter.

The Government of India has taken up various initiatives to support this sector. These include providing easier access to credit, simplifying regulations, and offering skill development programs. Some of the initiatives that can be mentioned are the MSME Self-Reliant India Fund, ASPIRE (A Scheme for Promoting Innovation, Rural Industries, and Entrepreneurship), Cluster Development Programmes, E-governance Initiatives, revision of the definition of MSME, etc. [1]. The revised definition of MSME (2020) has brought upward revision of investment limit; there is differentiation in the investment limit of manufacturing and service enterprises and turnover. An enterprise's turnover condition was not in the MSME Act 2006. Before the revision of MSME's definition, the Aspirational District Programme (ADP) was initiated by the Government of India in January 2018 to speed up the overall development of 112 of the most underdeveloped districts of India.[2]. The ADP also focuses closely on enhancing individuals' capacity to

fully engage in the country's rapidly growing economy and equitable development. Equitable development is an initiative having an objective to address the needs of marginalized populations by implementing policies and programs that lessen inequality and promote thriving, healthy communities [3]. Promoting education, skill development, financial inclusion, and basic infrastructure development are necessary for the country's MSME to flourish. In light of this, the current study aims to investigate the situation of MSME in the Aspirational Districts of Assam's Bodoland Territorial Area (BTR).

STATEMENT OF THE PROBLEM

The population of the BTR, Assam is mainly dependent on the agricultural sector. However, the area is perfect for natural lovers because of its scenic natural beauty. Hence, there is a high potential for the tourism industry. However, only a handful of Agri-based industrial units are available. The ADP was launched to speed up the overall development of the most underdeveloped districts of the country. If so, has the growth of MSME in the study area increased significantly after the implementation of ADP? What types of MSME have mainly emerged after the implementation of ADP? What type of relationship exists between the Social Category of Owners and the types of MSME? The present study attempts to answer these questions.

LITERATURE REVIEW

Studies that had been reviewed included studies on the ADP and Entrepreneurship Development in India. Some studies argue the ADP is a ray of hope for rural India [4], and [5], knowledge management's contribution to the transformation of the Aspirational Districts Program; some studies [6],[7], [8] highlight the state of entrepreneurship including women entrepreneurship in NE Region of India and sustainable entrepreneurship development. Some studies [9], and [10], examine how entrepreneurship can support women's empowerment and the reason for developing certain entrepreneurial traits among women entrepreneurs. The studies evaluate [11], [12], [13] the contribution of trade between Northeast India and Southeast Asia to the growth of entrepreneurship, 'Prospects and Challenges of Rural Entrepreneurship Development' and 'Entrepreneurship

through Micro Finance in North East India'. The role of entrepreneurship, the status of women entrepreneurship, and the plausible positive effect of the Aspirational District Programme (ADP) on various areas including entrepreneurship are described in these studies. While reviewing, hardly any study was found that covered the status of MSME in Aspirational Districts and changes in the MSME sector in the post-ADP in general and Sixth Scheduled Areas in particular. The present study attempts to fill this gap.

RESEARCH OBJECTIVES

1. To investigate the growth rate of MSME in the Aspirational Districts.
2. To examine the nature and type of MSME in the Aspirational Districts
3. To examine the relationship between the 'Social Category of Owners and types of MSME', 'Social Category of Owners and nature of MSME', between 'geographical location' and 'types as well as nature of MSME'.

HYPOTHESES

1. Ho1: There is no significant growth rate of MSME in the Aspirational Districts.
2. Ho2. No significant association exists between 'Social Category of Owners and type of MSMEs', and 'Social Category of Owners and nature of MSME' in the study area.

Methodology

The nature of the study is descriptive. The census method was applied for the present study. The total number of registered MSMEs during the study period is found to be 7784; Since the year of commencement of 1751 enterprises was not found, 6033 enterprises that had mentioned the year of commencement were considered. Both primary and secondary data were used in the present study. The primary data were collected from the office of the DICC of Aspirational districts and secondary data were collected from the UDYAM portal of the Ministry of MSME, Government of India. The study period is '1960 to 2022'. Area of the Study: Aspirational Districts in Sixth Schedule Areas of Assam- Out of seven districts in the Sixth Schedule Areas, two

districts (Baksa and Udalguri) are Aspirational districts. Both are under the Bodoland Territorial Region (BTR).

Brief profile of the study area: According to the 2011 Census, the study area has a total population of 17,81,743, [14]; out of this, the male and female populations are found to be 50.7 % and 49.3 % respectively. The majority of the population practices Hinduism (77.69 %). Of the total population, 13.9% practice Islam, while 7.92% are Christians. The percentages of the total population who practice Buddhism and Sikhism are 0.20 and 0.03%, respectively. Regarding language, 31.62 % of the population speaks Boro as their first language, 30.48 % speak Assamese, 18.56 % speak Bengali, 3.2% speak Nepali, and 1.78% speak Kurukh respectively. It reveals that the study area is a land of different communities having diverse cultures.

FINDINGS AND DISCUSSION

Growth of MSME

In the study area, from 1960 to 1970, the annual percentage growth rate is found to be zero. The cent percent positive growth rate is observed in the years, 1971, 1976, and 1983; 350 %, 400 %, 113 %, 212.50 %, 151 %, and 135 % positive growth rates of MSME in terms of commencement of enterprise are observed during the years 1984, 1990, 2000, 2005, 2010 and 2015 respectively. The negative growth rate is observed in the years 1972, 1981, 1985, 1987, 1991-1994, 1996 and 1998, 2001 and 2002, 2004, 2006, 2011, 2013, 2016 and 2020 respectively. The findings reveal a fluctuating trend in the percentage growth rate of MSME in the study area during the study period.

In the Post ADP, the percentage growth rate is found as 59.08% in 2018, 29.98% in 2019, 2.88% in 2020, 5.26% in 2021, and 40.00% in 2022 respectively. During the study period (1960 -2023), the highest number of enterprises (1092 enterprises) is found to be established in the year 2022. In the post-new economic policy of 1991 and the Pre-ADP (from 1992 to 2017), the number of MSME is found to be 1086 which is 18 % of the total enterprises of the study area. About 68 % of the total MSME (4121) commenced their activities between '2018 to 2023 (January)'. Based on the above discussions, it can be derived that the growth in terms of the number of MSME in the study area has increased manifold in the post-ADP.

Nature and types of MSME

In the present study, based on the activities performed, the types of MSME are divided into manufacturing and service; it is found that about 56 % of the total MSME are service-based enterprises and the remaining 44 % are manufacturing-based enterprises. About 33% of all MSME (32.9%) are owned by people belonging to the general category, while a significant portion (43.3%) are owned by Scheduled Tribes (ST). The owners of about 8 % (7.6 %) and 16 % of the total MSME of the study area belong to Scheduled Castes (SC) and Other Backward Classes (OBC). 98.5 % of the total MSME are micro-enterprises, and the remaining, 1.4 % and 0.1 % are small and medium enterprises respectively.

Types of MSME emerged in the post-ADP

Out of the total MSME established in the post-ADP, (which is 68 % of the total MSME), the majority (54.4 %) are service-based enterprises. During the pre-ADP too, the majority (58.7%) are found to be service-based enterprises. In both periods, in the study area, the number of service-based enterprises is more than manufacturing enterprises. It indicates that more service-oriented enterprises have emerged in the study area.

Hypothesis testing result

Ho1 testing result: To test the first hypothesis, firstly R square result was checked and one-way ANOVA was conducted; The R square value and the Adjusted R Square are found as .912 and .911 which indicates that the model is fit to run. The calculated CAGR is 12.3 which indicates that the MSME in the Aspirational Districts have significantly grown to the extent of 12.3 % per annum. The calculated p-value is also found to be .00 which is less than .05. It shows that there is a significant growth rate of MSMEs in the study area. Therefore, the hypothesis- 'There is no significant growth rate of MSME in the Aspirational Districts' is rejected.

Ho2 testing result: To test the second hypothesis, the Pearson Chi-Square was calculated. Regarding the association between 'Social Category of Owners and type of MSMEs', the calculated Pearson Chi-Square is found to be 81.706 and regarding the association between 'Social Category of Owners and nature of MSMEs' calculated Pearson Chi-Square is found to be

23.454. In both cases, the p-value is also found to be less than 0.05. Hence, the null hypothesis – ‘No significant association exists between ‘Social Category of Owners and type of MSME’, ‘Social Category of Owners and nature of MSME’ is rejected.

Major findings

- (a) There is a fluctuation in the % growth rate of MSMEs in the study area during the study period.
- (b) The majority of MSME are found to be established in the post-ADP.
- (c) Scheduled Tribes own more than two-fifths of the total MSME in the study area.
- (d) Most of the MSME are micro-enterprises;
- (e) The majority of the MSME are service-based enterprises.
- (f) The MSME in the Aspirational Districts has significantly grown to the extent of 12.3 % per annum over the period.
- (g) There is a significant association between the ‘Social Category of Owners and type of MSMEs’ as well as the ‘Social Category of Owners and nature of MSMEs’.

CONCLUSION

As mentioned, the study area is industrially as well as economically least developed region and inhabited by different communities. The area is very strategic from both the economic and political point of view of the country (India). Because, the area is bordering with Bhutan, very near to China and Bangladesh. Hence, the promotion of MSME is the need of the hour. The findings reveal a tremendous growth of MSMEs in both in service and manufacturing enterprises in the study area in the post-ADP. However, there are reports of the closing of several MSMEs during 2022-23 in India [14]. Though the present study hasn't covered such issues, by considering its seriousness, future studies may investigate and analyse the matter related to the closing down of MSME. The Government of Assam has emphasized bringing a new entrepreneurial ecosystem by introducing Assam Micro, Small, and Medium Enterprises (Facilitation of Establishment & Operation) Rules, 2023. According to this rule,

“In Assam, an MSME can begin operations by submitting the Declaration of Intent after receiving an ‘Acknowledgment Certificate’ from the State nodal agency.”. Hence, studies related to the changes in the MSME and the perception of educated youth on the establishment of MSME in the Aspirational Districts of Assam may also be conducted. In conclusion, based on the present study, the authors argue that the promotion of MSME in those industrially least developed areas (like the area of the present study) will accelerate India's vision of ‘Self Reliant India’ as the MSME is the only sector that promotes social inclusion, provides large employment opportunities [15] and creates the foundation of innovative and creative business units.

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Synchronising Diversity: Cross-Cultural Communication Challenges in Agile Workforce Management

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ABSTRACT

This research paper explores the cross-cultural communication challenges and solutions inherent in Agile global workforce management, with a focus on the Bhartiya perspective. In an increasingly globalized business environment, organizations are adopting Agile methodologies to enhance flexibility and responsiveness in project management. However, cultural differences among team members can pose significant barriers to effective communication and collaboration in Agile teams. Drawing upon a comprehensive literature review, theoretical frameworks, and empirical research, this study examines the specific challenges faced by Agile teams in navigating cross-cultural communication dynamics.

It identifies key issues such as language barriers, cultural norms, and divergent communication styles that impact team cohesion and performance. Additionally, the paper explores strategies and best practices for mitigating these challenges, including cultural awareness training, intercultural communication skills development, and inclusive leadership approaches. Through a Bhartiya lens, this research offers insights into the unique cultural characteristics, communication norms, and organizational dynamics prevalent in Indian workplaces. Ultimately, the findings contribute to a deeper understanding of the role of cross-cultural communication competence and cultural sensitivity in Agile global workforce management, with implications for theory, practice, and future research.

KEYWORDS: *Agile methodology, Cross-cultural communication, Cultural differences, Workforce management.*

INTRODUCTION

In today's globalized business landscape, organizations are continually seeking ways to enhance their adaptability and responsiveness to ever-changing market dynamics as seen in [1]. The significance of cross-cultural communication challenges in Agile global workforce management cannot be overstated. Cultural diversity within teams adds layers of complexity to communication and collaboration processes. Misinterpretation of communication cues, language barriers, and divergent communication styles can hinder effective teamwork, impede project progress, and jeopardize overall project success. These challenges are particularly pronounced in Agile environments where quick decision-making and seamless collaboration

are essential as quoted in [2]. Agility is rooted in the Latin word 'agere,' which translates to "to drive, act," signifying a sense of ownership and the capability to propel something forward. It also encompasses the notion of being able to move swiftly and gracefully. This trait is crucial in navigating the rapid changes in direction and form demanded by the contemporary business landscape. In summary, agility in project management is characterized by ownership, flexibility in direction, and adaptability. Key issues such as language barriers, cultural norms, and divergent communication styles will be explored in-depth to shed light on their impact on team cohesion and performance as mentioned in [3]. Moreover, this paper will propose strategies and best practices for mitigating these challenges. We propose to recommend essential tools for fostering

cultural competence and enhancing cross-cultural communication effectiveness in Agile teams in Indian context [4]. The topic of cross-cultural communication challenges and solutions in Agile global workforce management has emerged as a critical area of inquiry. Organizations operating in a globalized environment must navigate the complexities of cultural diversity to ensure effective collaboration and project success. This is particularly relevant in countries like India, where cultural nuances and social hierarchies significantly influence workplace dynamics. The Bhartiya (Indian) perspective adds a unique dimension to this topic which is also seen in [5].

LITERATURE REVIEW

For a long time, culture has been seen as an essential part of describing behavioural problems among individuals. As quoted in [1], in recent years, the need to study cultural aspects has increased as business becomes people-centric, especially when there is a need for the business to interact with individuals, whether as clients, representatives, service providers, or stakeholders. It has become a common practice for software development teams to work in different places. The problem of cultural incompatibility becomes even more acute when projects are being distributed among multicultural societies [11]. At a time when teams from different societies engage among themselves, multifaceted work connections can lead to further complications. A growing pattern of culturally diverse project teams makes it difficult to share a single “social standard”. This research paper talks about the challenges of implementing Agile project management in the public sector. As rightly mentioned in [6], attitude and behaviour at the workplace are meaningful in society. It goes with [7] the portion of social measurements within the light of Hofstede’s (2001) derivation, Chhokar, Brodbeck, and House’s (2007) extension, and Sharma’s (2010) derivation of cultural dimensions for national, organizational, and individual levels, separately. The Context Model by Edward T. Hall -Hall’s model (1976) [14] explores how cultural context influences behaviour and communication. It highlights differences between individualist and collectivist cultures and their management implications. Central to the model are ‘high context’ cultures, where communication is implicit, and ‘low context’ cultures, where it is explicit. [8]. Trompenaars and Hampden-Turner’s Seven

Dimensions of Culture, published in their 1997 book “Riding the Waves of Culture,” help us understand cultural differences to work more effectively and avoid misunderstandings. They discovered that people from different cultures differ in specific and predictable ways rather than randomly. This is because each culture has its own distinct way of thinking, unique values and beliefs, and varying preferences on a range of factors. [9]

PURPOSE OF THE STUDY

The purpose of this study is to investigate the cross-cultural communication challenges and solutions within Agile global workforce management, with a particular emphasis on the Indian perspective. In an increasingly interconnected world, where organizations are adopting Agile methodologies to improve project management practices, understanding, and effectively managing cultural diversity is paramount for success. This study seeks to address the gap in knowledge regarding the impact of cultural differences on Agile teams in the context of Indian workplaces. This purpose of the study is derived from a research paper [10] which has a similar purpose to the study. By examining the specific challenges faced by Agile teams due to language barriers, cultural norms, and divergent communication styles, this research aims to provide insights into the underlying dynamics that influence team cohesion and performance [12]. Additionally, the study aims to propose practical strategies and best practices for mitigating these challenges.

Objectives of the study

1. To have a deeper understanding of the specific challenges faced by Agile teams in cross-cultural communication.
2. To have insights into the role of cultural awareness and sensitivity in fostering effective Agile project management in a globalized business environment.
3. To give evidence-based recommendations for strategies and best practices to improve communication and collaboration within diverse teams.

RESEARCH METHODOLOGY

This study employs a survey-based research methodology. The utilization of surveys offers a systematic approach to gathering quantitative data,

allowing for the exploration of various dimensions of cross-cultural communication within Agile teams. These methodologies are also seen in the book [13]. This section outlines the key components of the survey methodology, including participant recruitment, survey design, data collection, and analysis.

Participant Recruitment -Participants for this study are recruited from organizations that utilize Agile methodologies in their workforce management practices.

Survey Design- The survey instrument – Questionnaire designed to collect data consists of both closed-ended and open-ended questions.

Data Collection- The survey was administered electronically using online survey platforms such as Qualtrics or SurveyMonkey for a period of four weeks.

DATA ANALYSIS

- Quantitative data from the survey was analysed using appropriate statistical methods to identify trends and patterns in responses.
- Qualitative data from the literature review was analysed through thematic analysis to extract key themes and insights.

Occupation of respondents

Table 1.

No.	Parameters	Number of Respondents	Percentage
1	IT/Technology	10	14.70%
2	Marketing /Sales	13	19.11%
3	Finance/Accounting	24	35.25%
4	Human Resource Management	11	16.17%
5	Fabrication	10	14.70%
	Total	68	100%

Occupation of respondents.

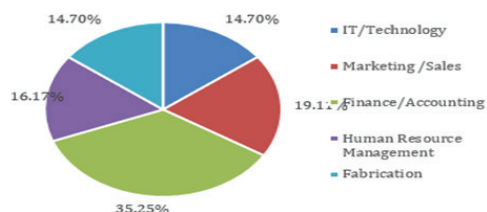


Chart 1

As seen in Chart no. 1 which is referred from Table no 1, the data we have collected consists the candidates from various fields such as IT/Technology (approx. 14.70%), Marketing/Sales (Approx. 19.11%), Finance/Accounting (35.25%), Human Resource Management (16.17%), Fabrication (14.70%). So, we can infer that the study is not for a particular sector or field. The Solutions can apply to various sectors.

Familiarity with Agile Methodology in the Global Workplace.

Table 2.

Sr No	Parameters	No of Responsibl e	Percenta ge
1	Very Familiar	4	5%
2	Somewhat Familiar	36	52%
3	Not Familiar	28	43%
	Total	68	100%

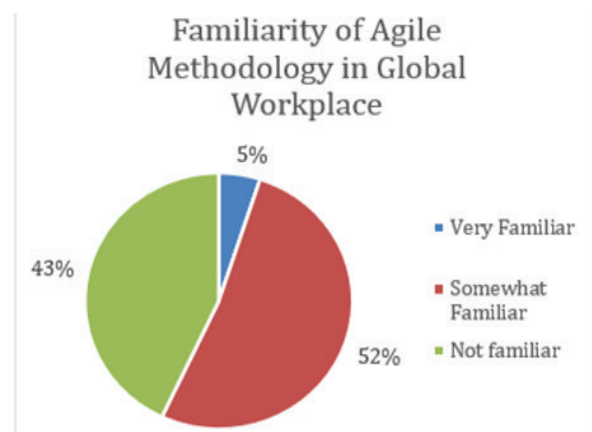


Chart 2.

As seen in Chart no. 2, which is referred from Table no. 2, we can see that most people have little knowledge of the Agile methodology in the workplace. Around 52% of people are somewhat familiar with the Agile methodology. There are around 43% of people who have no idea about the Agile methodology in the global workplace.

Challenges experienced when working with colleagues from different cultural backgrounds in Agile teams.

Table 3

Sr No	Parameters	No of Respondents	Percentage
1	Language barriers	15	22.05%
2	Misinterpretation of cultural norms	7	10.29%
3	Differences in communication styles	13	19.11%
4	Time zone Differences	12	17.68%
5	Conflicting work ethics/values	10	14.70%
6	Lack of cultural/training	11	16.17%
	Total	68	100%

Challenges experienced when working with colleagues from different culture backgrounds in Agile teams

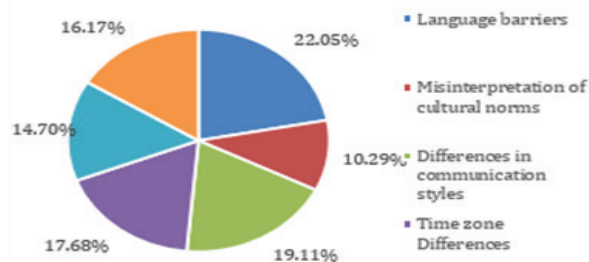


Chart 3

Chart no. 3 tells us that around 22% of the people think that the Language barrier is one of the prominent challenges faced by the employees, followed by differences in the communication styles. According to our study, we found that the language barrier hinders communication when working with Agile teams.

Cross-cultural communication challenges affect team collaboration and project outcomes in Agile workforce management.

Table 4

Sr No	Parameters	No of Responses	Percentage
1	Significantly hinder collaboration and Project Success	16	24%
2	Somewhat hinders collaboration and project success	30	44%
3	Having minimal impact on collaboration success project success	22	32%
	Total	68	100%

Cross culture communication challenges affect team collaboration and project outcomes in Agile workforce management

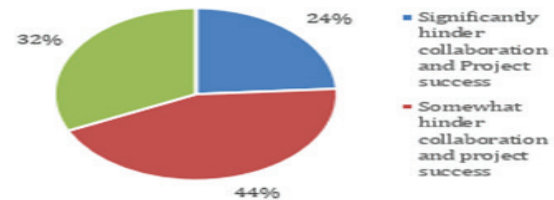


Chart 4

Chart no. 4 helps us to know that 44% of people think that cross-cultural communication hinders the success of a project, whereas 24% of people think it does not affect the success of a project.

What efforts is your organization making to manage the cross-cultural communication channels across teams?

Table 5.

No	Responses	No of Responses	Percentage
1	Arranging an initiative where all the people in the organization come together and carry out some activities that will create a bond between them.	25	36.76%
2	Trying to simplify complex processes and align the workforce towards a goal/Objective that is clearer for colleagues to understand.	10	14.70%
3	Use the English language for communication	15	22.05%
4	Provide training	8	11.76%
5	Create awareness about communication, arranging classes for the betterment of cross communication skill	6	8.82%
6	Multiple Projects with Different Teams	4	5.88%
	Total	68	100%

Efforts to manage the cross-culture communication

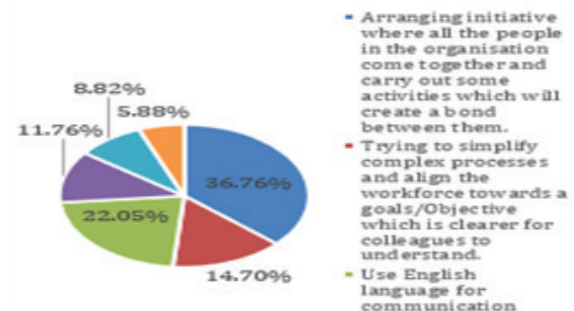


Chart 5

Chart no. 5 talks about what efforts are companies taking to manage cross-cultural communication, according to our survey, the main effort we found is companies bring together the people of the organization to create a bond between them through organizing various activities.

What strategies or solutions do you think are effective in addressing Cross-cultural communication challenges in Agile teams

Table 6.

Sr No	Parameters	No of Respondents	Percentage
1	Cultural sensitivity training	25	36.76 %
2	Clear communication protocol/guidance	18	26.47 %
3	Use of collaboration tools/software	10	14.70 %
4	Cultural exchange programs/activities	11	16.17 %
5	Assigning cultural ambassadors/mentors	4	5.88%
	Total	68	100%

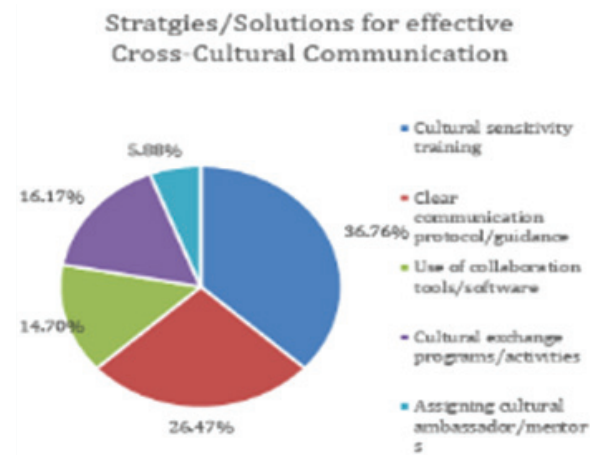


Chart 6.

Chart no. 6 is derived from table no. 6 which talks about strategies or solutions you think are effective in addressing Cross-cultural communication challenges in Agile teams. It is clear from our study and the above chart that Cultural sensitivity training and clear communication protocol/guidance are some effective solutions for working in cross-cultural environments.

What additional major or initiative do you believe could improve Cross-cultural communication in Agile Global Workforce Management

Table 7

No	Parameters	No of Respondents	Percentage
1	Embrace the differences between culture	48	70.58 %
2	No initiative	4	5.88 %
3	Keeping common communication language	16	23.52 %
	Total	68	100%

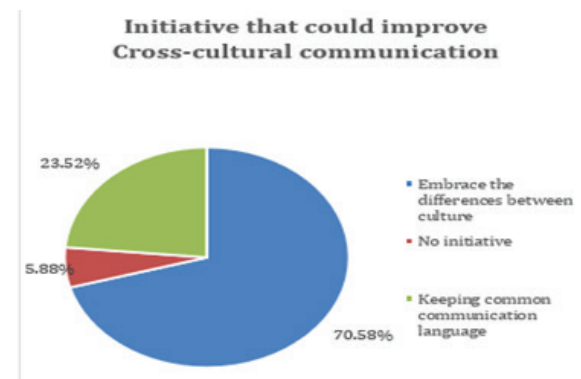


Chart 7

Chart no. 7 is derived from table no. 7 which talks about initiatives that could improve Cross-cultural communication. Around

70.58% of people agree that embracing cultural differences is one of the prominent solutions, while 23.52% of people feel keeping a common communication language is also the solution.

FINDINGS

1. Most individuals in the global workforce have a basic understanding of Agile methodology, which has been increasingly prevalent in various workplace settings worldwide. This means that Agile work culture is not that popular in Organizations, especially in India.

2. Language plays a crucial role while communicating in Agile methodology. Difference in communication style also is a challenge in communicating in Agile methodology. Proper Communication between Agile teams can make a team effort towards a project's success or can be a barrier to communicating effectively.
3. Organisations are taking the initiative to bring people together and arrange some activities that create a bond between them and know each other better. Employee interaction is necessary to make any project successful.
4. Because of the Cultural differences, there can be misinterpretations of cultural norms. We often have predetermined notions in our heads about another culture and that can be very hectic to work with employees having different cultural backgrounds.

SUGGESTIONS

1. Should have the English Language as a common language for communication between cross-cultural Agile teams.
2. Having a base language for communication in teams having different employees having different cultures can help in increasing productivity and understanding each other's perspective could be done more effectively.
3. Clear communication protocol/guidance training should be given to the employees who are working with cross-cultural Agile teams.
4. Cultural exchange programs should be arranged by the companies. Every culture has its beauty. Especially in India, we can find so many different people following different cultures and having different beliefs.
5. Cultural Sensitivity training should be given to the employees who are working with cross-cultural Agile teams.

CONCLUSION

As the world is evolving and technology is taking over, social interactions in cross-cultural is important for organizations and their growth in the competitive world. Our study defines the problems that can be changed to

the solutions by giving proper training and advice to the employees by the organizations. Agile teams can be beneficial for organizations as employee productivity can increase while working with cross-cultural employees. The Bhartiya (Indian) perspective adds a unique dimension to this topic. India's vibrant culture, diverse population, and rapidly growing economy make it a focal point for global business operations. Understanding the cultural intricacies of the Indian workplace is essential for multinational companies with operations or partnerships in India, as well as for Indian organizations expanding their presence on the global stage.

The purpose of this study is to investigate the cross-cultural communication challenges and solutions within Agile global workforce management, with a particular emphasis on the Bhartiya (Indian) perspective. In an increasingly interconnected world, where organizations are adopting Agile methodologies to improve project management practices, understanding, and effectively managing cultural diversity is paramount for success. This study seeks to address the gap in knowledge regarding the impact of cultural differences on Agile teams, especially in the context of Indian workplaces.

In the Indian context, Cross-Cultural groups/teams had to incorporate the Agile methodology to have a greater impact in their organizations. India is a diverse country, the scope for growth is great and Agile methodology can bring positive change in workplaces. Communication is not just about words but about building bridges of understanding by embracing differences actively listening and seeking common ground we can unlock a world of collaboration and innovation. The joy of cultural understanding is a lifelong one, paved with both challenges and remarkable opportunities. In an increasingly interconnected world, mastering Cross-cultural communication is no longer a luxury, but a necessity. By fostering empathy and embracing diverse perspectives, we can unlock the immense potential that lies at the intersection of culture.

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Financial Inclusion in the Digital Age: Leveraging Blockchain, Mobile Banking, and CSCs to Reach Rural Communities

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ABSTRACT

This paper explores the theme of financial inclusion led by technology, focusing on digital banking, blockchain and Common service centres (CSC) in rural areas. With the evolution of digital finance, powered innovations in the access-affordability-reach continuum are becoming more integrated with financial inclusion. Blockchain technology, due to its decentralized ledger concept, would be one of the most suited for trust in rural banking as they need transparency and security, which can only be offered by blockchain. Seamless transfer of transactions digital banking systems fill the gap in regions with poor traditional Backgrounds. Digital access points for banking and government services and CSCs are fundamental to rural financial outreach. Through indicators such as digital accounts, mobile banking use and blockchain adoption, this study evaluates political and economic environments, regulatory frameworks and the effects of technological innovation on financial inclusion in 160 countries. These digital dimensions can be explored further in future research as new areas to deliver inclusive economic growth.

KEYWORDS: *Blockchain technology, Financial technology, Financial inclusion, Common service centers.*

INTRODUCTION

This research on financial inclusion reveals the potential of technology, particularly through blockchain, digital banking and Common Service Centers (CSC), to address the financial divide among marginalized groups such as low-income adults, women and small businesses in developing regions. The decentralized and transparent nature of blockchain technology has the potential to lower transaction costs, enhance trust, and even secure financial transactions [1], thereby ensuring greater financial access for marginalized people. Then again, digital banking platforms and mobile banking innovations mean custom-made financial products can

actually be reached in rural places that were unable to be accessed way before.

In rural financial inclusion, the CSC model has also demonstrated effectiveness in bridging the gap between remote communities and their access to essential banking services that further develop economic resilience and inclusion. Appropriate technologies in finance provide adaptive financial solutions to the changing needs of those who are financially excluded and promote poverty reduction together with sustainable growth [2]. This paper focuses on the current status of financial inclusion, in particular, exciting developments in technology and new delivery systems that respond to the changing

needs of underprivileged segments. In particular, a broader assessment of these mechanisms within the blockchain, digital banking and CSC networks context opens up new opportunities to advance policies that leverage them towards achieving sustainable financial inclusion outcomes and that balance short-term gains with long-term financial stability and social equity across the underserved world.

FINANCIAL INCLUSION THEORY REVIEW

This review explores the theoretical foundations of financial inclusion within a digital world governed by blockchain and digital banking systems, starting from rural economies. However, the idea of financial inclusivity today is not just about making it available but also doing so through innovative tech solutions while decreasing costs and increasing transparency in order to provide equitable access to all. Blockchain has been a boom that guarantees secure and transparent transactions, which removes trust issues in underserved areas. Digital banking needs to include CSCCS, which connects rural populations to easy, on-demand access to savings, credit, and insurance. CSCs enable remote financial inclusion by bridging the physical and economic distance between local communities and banks, delivering banking services directly to rural doorsteps. Grounded in theoretical background, we posit that enhancing digital financial inclusion contributes to economic growth via innovation and efficient resource utilization [3], facilitating sustainable development both in rural and urban regions.

METHODOLOGY

The mixed-method approach is used in the study to investigate the role of blockchain, digital banking, and Common Service Centers (CSCs) on financial inclusion. The study uses secondary data from 160 countries and evaluates indicators such as the availability of digital accounts, mobile banking use, and diffusion of blockchain technology. They use quantitative techniques—regression analysis—to assess the political, economic, and regulatory factors that affect technological innovations. Discussion — reporting and exploring both the findings of CSCs, digital banking bridging the rural-urban financial divide, as well as its

implications: A few qualitative case studies (all over regions).

A THEORETICAL FOUNDATION

Financial Growth Theories

Technological innovations in financial systems often manifest the transformative role of technology across financial growth theories, from blockchain to digital banking and Common Service Center (CSC) banking at rural levels. Contemporary growth theories underline the importance of appropriate, accessible and inexpensive financial services to promote economic and social inclusion, close income inequalities, and develop sound financial systems. Blockchain technology is fundamentally transforming the way financial transactions are conducted, adding transparency and security, factors which form a cornerstone of financial growth for developing economies.

Blockchain Financial services that are built on blockchain have lower transaction costs, improve transparency, and reduce financial exclusion by enabling secure digital transactions for rural populations that were unbanked. It is consistent with supply-leading growth theories, where financial systems respond to endogenous economic development. By offering support to Common Services Centers (CSCs) in rural areas, digital banking services expand the banking infrastructure into remote areas of the country, thus bringing financial products such as loans, insurance and savings closer to low-income populations.

Financial Intermediation Theories

These digital models facilitate a direct linkage between surplus and deficit spenders, which is in line with the principles of financial intermediation theory. However, financial intermediaries, motivated by the blockchain, solve core problems of information asymmetry and transaction costs that underlie each factor in the growth-rate (i) list, which exacerbates increases in income inequality and limits capital accumulation. The decentralized nature of this technology allows small business owners and individual borrowers to live in rural areas without access to traditional financial systems. In addition, digital banking enables banks to reduce risk and control costs more effectively, promoting financial inclusion. As a result, this is bringing innovations

like digital and blockchain-enabled banking that are reshaping rural financial ecosystems with the potential to positively impact economic growth by bridging gaps between populations that are excluded from the traditional banking system. These systems facilitate broad-based access within the financial ecosystem and are, therefore, crucial in achieving sustained economic development through technological solutions to financial exclusion.

FINANCIAL INCLUSION THEMES IN THE EMERGING LITERATURE

Country and Regional Studies

Emerging literature has elaborated on financial exclusion through emerging technologies in Asia, Africa, Europe, and the US, among other places. Please read this section to understand how digital banking, Blockchain, and rural banking models neoteric access to financial services across the nation, including how innovations like CSC banking initiatives are boons for our country's rural economies.

Country Studies

Country-specific studies highlight the importance of digital technology and Blockchain on Financial Inclusion in specific socio-economic backgrounds. For instance, Bongomin et al. [4] highlight the improved access to financial services enabled by digital banking networks in Uganda, enabling more informed and accessible transactions and savings for rural residents. Moreover, EU migrants in Italy have been found using mobile banking services, thus facilitating the social and economic integration process. Likewise, digital financial instruments in South Africa are enabling women to access and use both formal and informal financial products that help narrow the gender gap [5]. In their studies for Argentina, Mitchell and Scote [6] find that policies supporting government-enabled digital payment alternatives decrease the demand for cash through affordable credit and debit solutions, increase tax harvesting, and contribute to formal banking access. Similarly, financial Inclusion through digital innovations geared towards under-served women, even in Bangladesh, has led to a greater direct relationship with accessibility and inclusivity of finance. Similarly, blockchain-based financial networks that avoid

traditional banking barriers have enhanced financial access in other regions like Palestine.

The UK/US Context

Both the UK and the US have a strong focus on digital banking and financial inclusion strategies, using technology solutions geared to serve populations that are unbanked or underbanked. Although some UK digital banking platforms provide equal access to financial products across the demographic spectrum, how banks merge and overcome the costs of providing such services remains a challenge [7]. Mobile banking campaigns aimed at the unbanked are becoming more common in the US, allowing a regulatory foundation for digital and mobile payments to open a gateway to low-cost financial goods. However, to really close financial inclusion gaps, solid regulation surrounding mobile banking security is still needed.

The African Setting

Fueled by increased mobile payment options and blockchain technology, digital finance has made leaps in financial Inclusion across Africa. For example, Leon & Zins [8] note that these technologies are needed to overcome deficiencies such as low income and the lack of access to banking. The turning of the digital finance platforms and the better connectivity of the internet are opening up entry to banking services, especially on outlying sides [9] Mobile wallets = Changing How the African Citizens Save, Invest and Spend (Financial Resilience + Inclusion)

Europe

European nations used digital tools to improve the accessibility and affordability of financial services. Government-backed low-interest micro-loan programs, for example, provide easy access to loans for communities in Europe that may otherwise face financial difficulty. In parts of the UK, for example, greater focus on mobile banking and Blockchain is offering cheaper financial solutions to marginalized groups [10].

The Australian-Asian Context

Other East Asian and Australian governments prioritize digital Inclusion, leading to models like the CSC banking model serving remote communities effectively. China has also witnessed the rapid rise of digital banking, exemplified by the provision of mobile

applications with fintech firms offering banking in underbanked areas that increases economic Inclusion and promotes socio-economic stability. CSCs play an important role in promoting banking services in rural places in India, with the provision of digital payment systems and e-KYC services making the gap between rural and urban economic situations [11]. Such initiatives highlight the promise that digital banking offers for expanding financial access, particularly in remote geographic locations.

MENA: Middle East and North Africa

Mobile and blockchain banking services are emerging in the MENA region as tools of choice to address low-income populations [12], foster financial stability and decrease poverty. Despite the increasing importance of Islamic finance, mobile payments and electronic wage payments, Financial Inclusion has made it possible for many people to gain access to wealth-generating services at low cost. These innovative features play an important role in liberating the poor from income inequality and poverty and suit local cultures as well as religions [13].

Table 1 Financial inclusion and explanatory factors

Author	Time Period considered for study	Focus Areas	Research Approach	Findings
Lai et al. [15]	2010-2016	Financial accessibility, technology & consumption	Ordinary least squares	Technological advancements enhance financial services availability, positively correlating with consumer expenditure.
Chinoda & Kwenda [16]	2004-2016	Mobile technology, economic advancement, banking competition	Descriptive statistics, unit root, variance decomposition, pooled OLS, Fixed effect GMM	Financial inclusion positively responds to changes in banking competition, mobile technology, and economic growth.
Evans [9]	2000-2016	Financial inclusion, internet, mobile devices & macroeconomic factors	Panel FMOLS approach & Granger causality tests	Internet and mobile technologies show a significant positive relationship with financial inclusion.
Kumar et al. [17]	2010-2021	Financial inclusion, electronic banking & poverty alleviation	Descriptive statistics & econometric analysis	Electronic banking plays a crucial role in reducing poverty by enhancing financial inclusion.

Multinational

Blockchain and digital banking are increasing financial Inclusion around the world, alleviating poverty and income inequality among regions [14]. Due to reinforced transparency and lower transaction costs, Blockchain is linked with the potential for broadening access to a wider spectrum of underbanked people. Studies stress the importance of adaptable regulation that supports these innovations, enabling financial Inclusion in emerging markets and providing customers with easier access to credit, savings and insurance.

Financial Inclusion Through Innovation and Technology

This component of the research emphasizes the benefits of financial inclusion in the literature. According to increasing research, financial literacy, creativity, stability, and technology may boost financial inclusion.

Many empirical studies analyze financial inclusion and explanatory factors using diverse approaches and periods, as shown in Table 1.

Ouma et al. [18]	2009-2014	Mobile financial services, savings & financial access	Descriptive statistics & logit regression	Mobile technology use increases access to financial services and the likelihood of saving.
Panda et al. [2]	2012-2021	Financial inclusion, electronic payment systems & financial literacy	Descriptive statistics & structural equation modelling	Electronic payment systems adoption positively influences financial inclusion.
Panda et al. [19]	2012-2023	Financial inclusion, mobile money & financial performance	Descriptive statistics & correlation analysis	Mobile money significantly improves the financial performance of banks in Ghana.

CONCLUSION

This research revealed that a large percentage of the global population is financially excluded from being able to lead a life with economic and social activity, in turn reinforcing wealth inequality. Having the potential to transform financial inclusion, especially in rural areas, technology-driven solutions—particularly blockchain, digital banking and Common Service Centres (CSCs)—can help build a stable economic ecosystem via end-to-end digitalisation. Blockchain technology, for example, can serve to secure transactions and increase transparency between providers fighting fraud, as some of them would believe in low-cost banks. Digital banking facilitates seamless services, and CSCs bridging the gap in far-flung areas serve as financial hubs to connect rural households with formal finance. The role of governments or regulators is to be facilitators by formulating policies that incorporate these technologies in the financial ecosystem to be accountable and responsive. Technological innovation in financial inclusion has been shown by research to create drivers for financial stability, poverty alleviation and economic growth. Additionally, understanding the regulatory implications of blockchain-based SFCs on financial inclusion will require future research in many areas, including digital access and whether the benefits that these products confer may outweigh the risks posed to vulnerable groups.

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Healthcare Access and Utilization: The Impact of Ayushman Bharat Health Account (ABHA) ID Card

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ABSTRACT

This research paper exclusively investigates the impact of the PM-JAY's Ayushman Bharat Health Account (ABHA) ID Card on healthcare access and utilization in India. Considering the diverse demographic and geographic characteristics of the country, the study employs a mixed-methods approach, more of an exploratory approach in order to analyze the effectiveness of ABHA in improving healthcare access, utilization, and health outcomes. Through surveys, interviews, and secondary data analysis, the research sheds light on the challenges and opportunities in implementing ABHA and offers insights for policymakers to enhance the program's efficacy. This research paper also puts a light on the different opportunities and challenges of the implementation of ABHA in different states, including the urban and rural areas as the country consists of most densely as well as less densely populated states. This leads to several challenges being faced and thereby leading to a delay in the availing of the benefits of the ABHA Id card that the Government wants the population to be benefited from. The major involvement of healthcare providers and their respective stakeholders along with digitization strategies plays a vital role in the effective implementation of this nation-wide health scheme.

KEYWORDS: Healthcare, Access, Utilization, ABHA, Ayushman Bharat, ABDM, HFR, LMIS, HMIS.

INTRODUCTION

The Ayushman Bharat Health Account (ABHA) launched in October 2022 by India's honorable PM – Mr. Narendra Modi is a healthcare transformative initiative under the Ayushman Bharat scheme, which aims to enhance the healthcare delivery system in India. Launched in 2018 by the Government of India, Ayushman Bharat is a two-pronged approach focused on health and wellness through the creation of Health & Wellness Centers (HWCs) and Pradhan Mantri Jan Arogya Yojana (PM-JAY), which provides financial protection against catastrophic health expenditures. Since its inception, PM-JAY has made significant strides in expanding healthcare access to millions of vulnerable families across India. The ABHA ID card plays a vital and crucial role in ensuring the smooth implementation and operational effectiveness of the scheme by:

- Enabling seamless identification and verification of beneficiaries.
- Enhancing the overall efficiency and transparency of healthcare delivery under PM-JAY.

Hence, the ABHA ID card under Ayushman Bharat PM-JAY represents a pivotal step towards achieving universal health coverage in India. It exemplifies the government's commitment to improving healthcare access and affordability for its citizens, particularly from under-privileged sections. The ABHA builds upon this foundation by promoting digital health records and improving access to quality healthcare services. [1]

The ABHA enrollment is primarily associated to the Ayushman Bharat Digital Mission (ABDM) launched on 27th September 2021 which aims to develop a strong framework which is necessary to support the integrated digital health infrastructure of the country. This initiative will serve as a bridge to eradicate the

gap amongst different healthcare stakeholders by strengthening digital highways. [2] [3]

OBJECTIVES OF THE STUDY

The following are the objectives of the study on “Healthcare Access and Utilization: The Impact of Ayushman Bharat Health Account (ABHA) ID Card”:

- To elaborate the awareness of the ABHA card enrollment amongst different states of India
- To evaluate the current scenario of enrollment of ABHA card holders in different states of India
- To elaborate the benefits and challenges faced by the ABHA card holders in availing the healthcare services

LITERATURE REVIEW

“James Scheibner, Marcello Ienca and Effy Vayena” in their research paper “Whose Health Record? A Comparison of Patient Rights Under National Electronic Health Record (Nehr) Regulations in Europe And Asia-Pacific Jurisdictions” published in 2021 highlighted a major concern, with respect to the “rights of the healthcare data”, stating that the data to be entered and/or erased should be in the hands of the stakeholders or the citizen himself, whether completely or to certain extent as the consequences of this decision for quality of care and liability is utmost important. They also stated that for distinguishing between different forms of technology supporting patient rights (namely, de-identification and patient access), legislation should remain technology agnostic. Instead, regulations that can be modified should be used to set the necessary protocols and technical requirements, thereby providing sufficient flexibility to allow researchers to link data for epidemiological research purposes. [4]

“Neeta Kumar, Madhulika Mehrotra, Ravleen Kaur Bakshi, Vinodh Gnana” in the research paper, “Factors Affecting Acceptability of Ayushman Bharat Health Account (ABHA) Digital Health ID: A Multicentre Study” published in October 2023 in ‘A Journal of Health Professions’ stated that the comparative analysis of utilization patterns of ABHA in the states of India were done only in terms of qualification and occupation, but the socioeconomic status of the respondents were not evaluated in this research, thereby giving a lack

of evidence on the utilization patterns of the socio-economic strata of individuals. [5]

“Sushila Paliwal, Suraiya Parveen, Ompal Singh, M. Afshar Alam, Jawed Ahmed” in their research paper “The Role of Ayushman Bharat Health Account (ABHA) in Telehealth: A New Frontier of Smart Healthcare Delivery in India” published in May 26th, 2023 [6] focused only on the challenges and implications of ABHA but the future scope of benefits and improvisation can be studied later.

RESEARCH METHODOLOGY

The research design of this study is primarily a qualitative approach and descriptive in nature and the data is collected from different secondary sources like news articles, national and international research articles, statistical data published by MoHFW and the government authorized official websites of ABHA, ABDM, Digital India etc.

ABHA: AN OVERVIEW

ABHA number is a 14 digit unique health identification number that will identify individuals as a participant in India’s digital healthcare ecosystem and establish a trustable identity that will be accessible and utilized by the healthcare providers across the country to store citizen’s healthcare data. This would establish a Unique & Trustable identity across different healthcare providers and link all healthcare benefits ranging from public health programs to private insurance schemes to your unique ABHA number. This would provide hassle-free access to healthcare facilities thereby reducing the waiting times and enhance accessibility to the different healthcare facilities. There would be a seamless sign up for PHR (Personal Health Records) applications which will be beneficial for healthcare data sharing. [2]

Difference Between ABHA Cards and Ayushman Bharat Cards

The citizens of India do not have a complete understanding of these 2 initiatives by the Prime Minister’s health missions and often they are misinterpreted, misunderstood and mostly used as synonyms for each other, primarily because both are linked to Aadhar Card UID number.

Ayushman Bharat Card is a cashless healthcare support exclusively for the underprivileged families as identified by SECC (Socio-Economic & Caste Census) whereas ABHA health ID can help you access and share health records digitally as it is available for all and directly linked to the Aadhar Card [7] [8]

Ayushman cards provide free critical healthcare treatment which covers up to ₹5 Lakh per family annually whereas ABHA card is a unique healthcare identity that digitally stores unlimited medical records. To avail the healthcare services for the under privileged beneficiaries, the Ayushman card is mandatory but having an ABHA number is optional.

Key Features of ABHA ID Card

1. Identification and Eligibility: The ABHA ID card serves as a unique identifier for beneficiaries enrolled under PM-JAY. It helps healthcare providers verify the eligibility of individuals and families for their cashless treatment at empaneled hospitals.
2. Cashless Treatment: One of the primary benefits of the ABHA ID card is that it facilitates cashless treatment for beneficiaries at any of the empaneled hospitals under PM-JAY. This reduces the financial burden on families by covering hospitalization expenses up to a specified limit.
3. Portability: The ABHA ID card allows beneficiaries to avail of healthcare services across India. This is particularly beneficial for migrant workers and families who move between states, ensuring continuity of healthcare coverage wherever they go.
4. Paperless and Transparent: The initiative aims to streamline healthcare delivery by reducing paperwork and ensuring transparency in the claims process. The ABHA ID card integrates with the PM-JAY digital platform, enabling efficient management of healthcare records and claims.
5. Empowerment: By providing access to quality healthcare services without financial constraints, the ABHA ID card empowers beneficiaries to seek timely medical treatment, thereby improving health outcomes and reducing out-of-pocket expenses. [2]

Subsequent implementation and initiatives for effective utilization

The below figure gives a workflow of ABHA can be successfully utilised by primary registration of Indian citizen to generate unique Health Id – ABHA 14digit number, generate healthcare records by assessment and utilisation of healthcare services across the nation and making necessary arrangements for the safety and security of healthcare data to maintain the privacy as well as retrieve the data as when required.

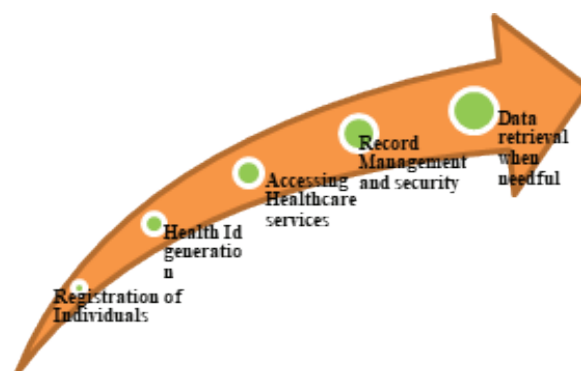


Fig. 1. Workflow of ABHA Utilization

Healthcare Professionals Registry

HPR is a complex repository of registered professionals and verified different system of medicines along with Nurse practitioners delivering healthcare services across India. The ABDM empowers healthcare professionals and encourages to be part of India's digital health ecosystem through a unique Healthcare professional ID. With last mile coverage, people will be able to interact with healthcare practitioners or vice versa. The HPR ensures that the qualified healthcare professionals are given the training to practice medicine with competence and ethical conformity. [9]

Health Facility Registry (HFR)

HFR is also a complex repository of health facilities of the country. It includes both public and private health facilities like hospitals, diagnostic laboratories and imaging centers, clinics, pharmacies etc.

A owner of the health facility has to register their facility to generate a Facility ID as specified by the NDHM. [9]

Benefits of the National Healthcare Providers Registry

- Unique and Trustable Identity

- Online Presence and Discoverability
- Teleconsultation
- Unified Digital Services

Current Scenario

As per the sources dated 27th October 2024 around 67,78,62,643 ABHA Ids are created, 3,43,867 verified facilities on Health Facilities Registry and 4,93,375 verified healthcare professionals are successfully registered in the ABDM portal. [10]

As per the article by MoHFW for PIB Delhi on 30th July 2024 more than 5,800 Public Healthcare Institutions have deployed ABHA-based Scan facilities. The Scan and Share registration facility is actively benefiting more than 1.80 lakh patients every day as it is used in more than 2400 hospitals currently. Moreover, since October 2022, more than 3.87 crore patients have been benefited by the program. [11]

Several key measures have been undertaken by the GoI, to facilitate ABHA-based scans in OPDs of those hospitals which are registered on HFR and uses ABDM compliant Hospital Management Information System (HMIS), to generate a QR Code, wherein these patients can scan the QR code for registering for the OPD of the facility. Lab Management Information Systems (LMIS) and Diagnostic software solutions can integrate with ABDM enabling them to provide digital lab reports directly to the patients.

As per the data published earlier on 6th February 2024, Uttar Pradesh, Maharashtra and Madhya Pradesh were highest ranking in ABHA registrations with enrollments as 6,62,03,035, 4,71,16,865 and 4,28,37,762 respectively followed by Gujarat and Andhra Pradesh. With respect to the same, states/ union territories like Ladakh, Arunachal Pradesh and Lakshadweep 3,70,982, 3,32,675 and 99,540 respectively. [12]

Opportunities & Challenges

While working on this research paper, several healthcare stakeholders were interviewed they were aware of the ABHA Id card would provide access to the healthcare services, provide them details of the Health Insurance coverage, digitally store their health records along with provide an easy access to the medical history.

On the other hand, they feel that the ABHA I'd card needs awareness campaigns to attract more population, a lot of technical support to ensure the efficacy of the record maintenance, training on usage for the different stakeholders involved in the implementation along with integration of ABHA with numerous healthcare providers like hospitals, pharmaceutical companies, health insurance providers, TPA companies along with Health IT companies and many more.

The secondary sources state that every Indian would get a unique Health ID as the same as their UAN and anytime they visit a general practitioner, pharmacy or laboratory, all the details will be registered and stored in this health Id containing details of every test availed, any disease, doctors or consultants visited, medicines prescribed and procured along with detailed diagnosis. The ID card would be linked to the Aadhar card which is directly linked to the mobile number, thereby resembling its uniqueness to the specific individual.

Subsequently, The National Health Authority (NHA) also announced the integration of the ABDM with their online application - Aarogya Setu app, which will help all Indians generate a unique health identity, ABHA from their Aarogya Setu account itself. This merger will allow citizens digitally access their personal health records and useful services from the national digital health system, thereby giving clarity to the healthcare caregivers in planning and managing the line of treatment for their patients.

Opportunities for Improvement and Expansion

- **Strengthening Primary Health Care:**
Expanding the role of community healthcare workers in efficiently delivering primary healthcare services and health education. Promoting telemedicine and mobile health applications to bridge geographical gaps and improve access to specialist consultations.
- **Capacity Building and Training:**
Investment in capacity building along with training and development for healthcare professionals, especially in the remote-rural and underserved areas, thereby strengthening the Healthcare force can also be an added advantage. Enhancing skills in managing chronic diseases and preventive healthcare through continuous medical education.

- **Public-Private Partnerships (PPP):**

Leveraging PPP models to improve infrastructure development, service delivery, and healthcare innovation. Collaborating with private insurers to expand coverage and financial protection for healthcare services.

- **ICT Integration and Innovation:**

Scaling up digital health solutions for electronic health records, teleconsultations, and health information exchange. Utilizing data analytics for evidence-based policymaking, resource allocation, and predictive healthcare planning.

- **Community Engagement and Empowerment:**

Implementing community-based health literacy programs would help in empowering individuals in managing their health status. The engagement of local communities in planning of healthcare services and decision-making processes can lead to efficient implementation of this scheme.

Challenges in Implementing ABHA

- **Infrastructure and Resource Constraints:**

There have been significant disparities in healthcare infrastructure of the urban and rural areas, with rural areas often lacking adequate facilities and trained personnel. The significant shortage of healthcare professionals, especially in underdeveloped areas, certainly affects the delivery of service.

- **Financial Sustainability:**

Limited financial resources allocated to healthcare, impacting the implementation and sustainability of ABHA initiatives. Challenges in effectively allocating funds to ensure equitable healthcare access across the states.

- **Healthcare Access Barriers:**

Remote and hilly regions pose challenges in accessing healthcare services. Economic barriers affecting affordability of healthcare services, especially for marginalized communities.

- **Information and Communication Technology (ICT) Infrastructure:**

Unequal access to ICT infrastructure and connectivity, hinders the adoption of advancements such as telemedicine and digital health solutions. Limited integration and interoperability of health information systems, impacting data-driven decision-making and service coordination.

- **Healthcare Quality and Accountability:**

Ensuring a consistent quality of care across healthcare facilities, including adherence to clinical guidelines and patient safety protocols. Challenges in implementing robust monitoring and evaluation techniques to accurately assess the impact of ABHA's initiatives.

Although ABHA is presently voluntary, there are high chances it will be made mandatory for accessing some services, similar to the trajectory of Aadhaar. The benefits of digitalization will not be realized amongst the rural and the poor due to less usage of smartphones by the under privileged socioeconomic strata. According to a source in 2005, the UK's National Health Service had started a similar program which could not succeed and unfortunately was shut down. Eventually, the possibility is high of something similar happening with ABHA.[13]

Policy Implications for Enhancing Healthcare Access and Utilization

- **Policy Alignment and Integration:**

Promoting integrated healthcare delivery models to ensure comprehensive and coordinated care. Enhancing inter-sectoral coordination among health, education, and social welfare departments to address determinants of health.

- **Financial and Regulatory Reforms:**

Mobilizing additional resources for healthcare through innovative financing mechanisms and public-private investments. Strengthening regulatory frameworks to ensure quality standards, patient rights protection, and ethical healthcare practices.

- **Equity and Access:**

Designing targeted interventions to address healthcare disparities based on geographic, socioeconomic, and demographic factors. Working towards achieving universal health coverage by expanding insurance coverage and reducing out-of-pocket expenditures.

- **Technology and Innovation:**

Developing a comprehensive digital health strategy with clear objectives, governance frameworks, and data privacy safeguards [14]. Providing incentives for healthcare innovation and technology adoption to improve service delivery and patient outcomes.

- **Monitoring and Evaluation:**

Conducting regular assessments and evaluations of ABHA initiatives to measure progress, identify gaps, and refine strategies. Establishing feedback mechanisms involving stakeholders to ensure continuous improvement and responsiveness to community needs.

RECOMMENDATIONS FOR FUTURE RESEARCH

Although the research paper discussed the opportunities, challenges, implications and updates of the ABHA Health Id card, this study can be explored in a much more detailed way by conducting longitudinal studies to monitor the long-term impact of ABHA on health outcomes, healthcare utilization patterns, and disparities across different demographic groups. This research can further be expanded by doing comparative analysis with controlled groups or neighboring states to further validate the findings and identify the best practices in healthcare reform implementation state-to-state. Investigation of strategies for strengthening healthcare systems, including the role of public-private partnerships, innovative financing mechanisms, and regulatory reforms along with exploring them to reduce healthcare disparities based on socioeconomic status, geographic location, and cultural factors, ensuring equitable access of the healthcare services to all strata.

By addressing these research gaps and building upon current findings, policymakers and practitioners can refine healthcare policies, improve service delivery,

and ultimately achieve better health outcomes for the population of India. This approach will contribute to a more resilient and responsive healthcare system which would be capable of meeting the evolving healthcare needs of its citizens.

CONCLUSION

The country deals with a massive burden of communicable diseases due to inadequate sanitation and healthcare access in rural and urban slum areas. On the other hand, non-communicable diseases are also on the rise, thereby challenging the healthcare system's capacity and hence there is a need for improved health information systems and data management to track disease trends, monitor healthcare delivery, and define policy decisions effectively to make ABHA a massive success.

Addressing the mentioned challenges requires a multi-pronged approach involving increased healthcare investment, development of infrastructure, workforce training, improved health financing mechanisms, and targeted public health interventions. Government initiatives and partnerships with NGOs and private sectors are crucial for achieving equitable healthcare access and improving health outcomes across the country.

Fostering greater adoption of telemedicine and digital health solutions to mitigate geographical barriers and improve healthcare delivery efficiency can prove beneficial in overall implementation and utilization of this National scheme. Additionally, implementing robust quality assurance mechanisms to ensure consistent standards of care across all healthcare facilities can help in effective utilization of the digitally stored medical records of ABHA.

Alternatively, enhancing community engagement strategies to foster health literacy and empowering individuals in managing their health effectively can pave a way for better implementation of ABHA. Strengthening partnerships between health, education, and social welfare sectors to address the broader determinants of health and utilizing data analytics for evidence-based healthcare policy making for equitable resource allocation can thereby enhance service planning and delivery.

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Digital Intelligence, FOMO, and Psychological Influences: A Critical Review of Sustainable Business Innovation

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ABSTRACT

In “Digital Intelligence and the Misguided FOMO: The False Promise of Sustainable Business Innovation,” critiques the integration of digital intelligence (DI) in modern businesses, emphasizing the dangers of adopting such technologies out of Fear of Missing Out (FOMO). The paper elucidates the importance of DI, which involves using data reckoning, artificial intelligence (AI), and machine learning (ML) to enhance business operations and customer experiences. However, the hasty rush to implement these technologies oft leads to inadequate outcomes, over investment, and unrealistic expectations. Key psychological factors, such as envy and traits from the dark triad of personality (narcissism, Machiavellianism, and psychopathy), drive precipitous DI adoption. The author highlights the fallacy that DI inherently contributes to sustainability, pointing out the resource-intensive nature of DI technologies and the moral dilemmas they may pose, such as data privacy transgressions and algorithmic bias. Furthermore, the paper discusses the disconnect between academic theories and practical truths in DI adoption, suggesting that businesses oft follow misguided leadership without critical scrutiny. To navigate these challenges, the author advocates for a balanced approach that includes strategic forethought, pilot programs, and continuous improvement. In conclusion, while DI presents opportunities for innovation, businesses must be wary of the snare associated with FOMO and misguided adoption to achieve sustainable growth and competitive advantage.

KEYWORDS: Digital Intelligence (DI), Fear of Missing Out (FOMO), Innovation, Data analytics, Artificial Intelligence (AI), Machine Learning (ML), Sustainability, Psychological factors, Dark triad traits, Ethical issues, Technical glitches, Business strategy, Co-dependent anonymous (CoDA), Academic disconnect, Case studies, Organizational behaviour.

INTRODUCTION

In this present day's fierce digital realm, digital intelligence (DI) is held as a core driver of innovation and operational efficiency. DI weaveth together technologies such as data analytics, artificial intelligence (AI), and machine learning (ML) to enable traders to make data-driven decisions, streamlining processes, and personalizing customer experiences. However, the hasty rush to integrate DI oft giveth rise to the Fear of Missing Out (FOMO), which may lead organizations into premature or ill-planned implementations. This treatise critically doth examine DI's role in business innovation, illuminating the risks

of FOMO-driven adoption, the psychological forces that sway DI adoption, and the false equivalency of DI with sustainability. Furthermore, it doth explore both the technical and ethical dilemmas associated with DI implementations, the gulf between academic doctrines and practical realities, and the psychological underpinnings, particularly the Dark Triad traits, which influence corporate behavior.

The Role and Risks of Digital Intelligence in Business Innovation

Digital intelligence (DI) doth play a transformative role in modern business innovation by uniting diverse tools and strategies that utilize data to create

actionable insights. These tools assist organizations in making data-driven decisions, fostering customer engagement, and optimizing operational efficiencies. Key components of digital intelligence include: Data Analytics which doth enable trend identification and strategic decision-making by examining vast datasets, allowing organizations to make predictive and informed choices. Artificial Intelligence (AI) and Machine Learning (ML) which support automation and enhance decision-making through algorithms that can learn from and adapt to new data patterns. Customer Relationship Management (CRM) Systems that enhance customer engagement by gathering and analyzing data on customer behavior, preferences, and interactions. Lastly, the Internet of Things (IoT) doth connect devices across operations to create a more responsive, data-driven ecosystem that doth improve operational efficiencies and responsiveness. Industry leaders such as Amazon and Netflix do showcase the potential of DI by employing these tools to personalize user experiences and accurately predict customer needs. Forsooth, through robust recommendation algorithms powered by AI and data analytics, they can continuously refine their offerings to enhance customer satisfaction and engagement. Yet, many companies feel a heavy pressure to adopt DI technologies with haste, oft spurred by a fear of missing out (FOMO) on the perceived advantages of DI rather than by a well-defined strategic necessity. This FOMO-driven haste can lead to suboptimal results, for companies may implement DI solutions without due diligence, lacking full understanding or preparation for the long-term integration and operational demands [1].

The Emergence of FOMO in Digital Intelligence

In today's corporate landscape, the fear of missing out (FOMO) has become a powerful driver behind digital intelligence (DI) adoption. Companies are often motivated by a concern that delaying or bypassing DI technologies may cause them to fall behind competitors. This fear is intensified by the rapid advancement of technology, where organizations see DI as a means to achieve competitive advantages, improve customer engagement, and optimize decision-making processes. However, this urgency can lead to hasty decisions and imprudent investments in DI, resulting in significant challenges that may hinder rather than help long-term

success. This FOMO-driven rush to adopt DI has created several key challenges:

Rushed Implementations: In the race to integrate DI solutions quickly, companies often sacrifice comprehensive planning and due diligence. Without adequate preparation, DI systems may suffer from poor integration within existing processes and systems, leading to fragmented data flows, reduced system performance, and difficulties in achieving expected outcomes. For example, a rushed DI system might lack interoperability with other software or fail to scale effectively as more data and use cases are introduced, diminishing its intended impact and functionality.

Overinvestment: Many organizations allocate disproportionately high resources to DI initiatives, sometimes at the expense of other critical areas. This overinvestment can create an imbalance in resource distribution, where funding, staffing, or attention is diverted from essential operational functions or development projects that are equally important to the company's overall success. As a result, overinvestment in DI can strain organizational budgets and compromise long-term sustainability, leaving other areas underfunded or inadequately supported [2].

Unrealistic Expectations: When companies adopt DI technologies with the expectation of immediate, transformative results, they often overlook the gradual, iterative nature of realizing value from DI systems. Implementing and optimizing DI takes time, requiring ongoing refinement and adaptation to align with organizational needs. However, FOMO-driven decisions can create an environment where leaders and stakeholders expect rapid returns, leading to disappointment if the anticipated impacts are not immediately visible. These inflated expectations may cause organizations to abandon or undervalue DI initiatives prematurely, overlooking their potential for incremental and long-term benefits [3].

Collectively, these FOMO-driven behaviours can result in a misalignment between the DI systems implemented and the organization's true needs. Rather than enhancing performance, rushed decisions may compromise the technological value of DI investments and reduce strategic coherence, potentially leaving the

company with fragmented and ineffective systems that do not serve their intended purpose.

Psychological Underpinnings: The Influence of the Dark Triad

The push for digital intelligence (DI) adoption in corporate environments is often influenced not only by market demands but also by individual psychological factors, especially those associated with the Dark Triad traits: narcissism, Machiavellianism, and psychopathy. These traits can significantly impact leadership decisions, steering DI adoption for motives that may not align with organizational welfare.

1. **Narcissism:** Leaders with narcissistic tendencies may advocate for DI adoption as a means of enhancing their personal image. Such leaders may be driven to appear innovative and progressive, valuing the prestige of adopting DI technologies more than their actual utility to the organization. This can lead to situations where DI initiatives are pursued for their symbolic value rather than their practical impact, creating a misalignment between technology investments and organizational needs [4].
2. **Machiavellianism:** Leaders exhibiting Machiavellian traits may use DI manipulatively to achieve personal or political goals within the organization. This manipulation often involves exploiting data insights and digital systems to consolidate power or gain control over others. Such leaders might prioritize their personal agendas over ethical standards, resulting in decisions that could harm the organization's culture or undermine trust. For instance, DI may be leveraged to monitor employee behavior excessively or to influence corporate narratives in ways that benefit the leader's interests rather than fostering a supportive or transparent environment [5].
3. **Psychopathy:** Leaders with psychopathic tendencies may approach DI adoption with a focus on immediate results, showing little regard for the potential long-term risks or ethical implications. This drive for rapid gains can manifest in impulsive DI strategies that emphasize short-term wins, often at the cost of organizational integrity. A psychopathy-driven

approach might result in reckless or ethically questionable uses of DI, exposing the organization to financial or reputational damage if DI strategies are poorly aligned with sustainable, ethical practices [6].

To mitigate the risks associated with these self-serving tendencies, organizations can draw on principles from Co-Dependent Anonymous (CoDA), which advocate for a more relational and collaborative approach to decision-making. CoDA's emphasis on relational awareness and mutual respect encourages leaders to prioritize collective benefits over individual ambition. By fostering a decision-making framework that values collaboration, companies can reduce the influence of impulsive or self-centered behaviours in DI adoption, leading to more balanced, thoughtful technology investments that align with long-term organizational goals [7].

The False Promise of Sustainability through Digital Intelligence

There is a widespread, yet misguided, belief that digital intelligence (DI) inherently supports sustainability goals. This assumption often overlooks key challenges that can hinder true sustainability in DI initiatives:

- a) **High Resource Demands:** The infrastructure supporting DI, especially data centers, demands significant energy resources. These centers often rely on non-renewable sources, contributing to high carbon emissions. As DI technologies expand, the associated environmental costs continue to rise, challenging the notion that DI is inherently sustainable. Energy-intensive data processing and storage can counterbalance any environmental benefits DI might offer, complicating efforts to align with sustainability goals [8].
- b) **Focus on Short-Term Gains:** Many organizations prioritize immediate returns on investment (ROI) over long-term sustainability, a tendency that can divert resources away from genuinely sustainable practices. DI projects are often deployed to maximize short-term profits or performance improvements, making it difficult for companies to maintain a balanced focus on sustainability. Consequently, the emphasis on rapid results can lead

to an unsustainable cycle of technology upgrades that prioritize immediate financial benefits over environmental considerations [9].

- c) **Ethical Dilemmas:** While DI holds potential for positive social impact, it also raises ethical concerns that may undermine social sustainability. For example, DI systems can lead to data privacy issues, as large volumes of personal data are collected, stored, and analyzed. Additionally, biases embedded within AI algorithms can perpetuate inequalities or lead to discriminatory outcomes, contradicting the principles of social sustainability. These ethical challenges illustrate that DI, when applied without adequate safeguards, can generate social costs that compromise its role in sustainable development [10].

In light of these issues, DI alone does not guarantee sustainability. Achieving true sustainability requires careful planning, ethical standards, and a balanced approach to technology adoption that considers both environmental and social impacts.

TECHNICAL CHALLENGES AND ETHICAL ISSUES IN DI

Implementing DI goes beyond simply integrating data-driven solutions—it involves navigating a landscape of technical complexities and ethical considerations that can strain resources and compromise trust. The following key challenges illustrate these concerns:

1. **Technical Issues:** Deploying DI technologies requires seamless integration with existing systems, yet this process often encounters various obstacles. Technical challenges, such as software bugs, inadequate scalability, and system integration failures, can disrupt core operations and delay project timelines. The need for DI solutions to perform reliably at scale adds further pressure, as companies must manage data flows and processing power without compromising efficiency. When these technical issues arise, they can diminish stakeholders' trust in the DI framework and lead to higher maintenance costs as organizations work to correct ongoing issues.
2. **Privacy Concerns:** DI relies on vast quantities of data to derive meaningful insights, which

inherently raises data privacy risks. Collecting, storing, and analyzing personal data can infringe upon individual privacy rights if not carefully managed, bringing organizations under scrutiny. Privacy concerns are heightened by the need to comply with stringent regulatory standards, such as GDPR in the European Union, which mandates transparent data handling and robust user consent mechanisms. Failure to adhere to these regulations can result in reputational damage, legal penalties, and a loss of consumer confidence. The high stakes of data privacy thus add another layer of complexity to DI adoption, pushing organizations to invest in secure data practices that may demand additional resources [11].

3. **Algorithmic Bias:** One of the most pressing ethical issues in DI is the potential for algorithmic bias. AI algorithms, which drive many DI solutions, are trained on historical data that may carry biases or reflect social inequalities. When these biases go unchecked, they can lead to discriminatory or unjust outcomes in areas like hiring, customer profiling, and law enforcement. Algorithmic bias poses a significant ethical vulnerability, as it can perpetuate stereotypes or unfairly disadvantage specific groups. To mitigate these risks, organizations need to audit their AI systems regularly, incorporate diverse datasets, and establish accountability frameworks that ensure fairness in algorithmic decision-making [12].

Addressing these technical and ethical challenges is essential for companies to harness DI responsibly and effectively. Balancing innovation with ethical considerations enables organizations to build trust with their stakeholders and ensure that DI technologies contribute positively to both business and society.

The Disconnect Between Academic Theory and Business Realities

The application of DI is reflected through a spectrum of case studies that highlight both successful implementations and cautionary tales:

1. **Successes:** Prominent companies like Walmart, Sephora, and Flipkart exemplify successful DI utilization. Walmart has effectively leveraged DI

to enhance its supply chain operations, employing data analytics to optimize inventory management and streamline logistics. This has resulted in improved operational efficiency and reduced costs. Similarly, Sephora has utilized DI to foster customer engagement through personalized marketing strategies and enhanced in-store experiences driven by data insights. Flipkart has adopted predictive analytics to better understand customer preferences and forecast demand, which has significantly enhanced its ability to cater to consumer needs. The positive outcomes of these implementations demonstrate how effectively harnessed DI can lead to increased efficiency and customer satisfaction across diverse sectors [1, 2].

2. Pitfalls: Conversely, several high-profile failures underscore the risks associated with hasty, FOMO-driven DI projects. General Electric's (GE) Predix platform, intended to revolutionize industrial IoT through advanced analytics, has struggled with scalability and user adoption, revealing the pitfalls of overestimating the readiness of both technology and market conditions. Similarly, Hertz's collaboration with Accenture on a website redesign exemplifies how poorly executed DI projects can result in operational setbacks and wasted resources, as the initiative failed to deliver the expected improvements in user experience. Additionally, India's Aadhaar system illustrates the complexities of maintaining privacy and security in large-scale DI applications. Despite its ambitious goals of providing universal identification, the implementation has raised significant concerns regarding data privacy, security vulnerabilities, and ethical implications, highlighting the critical need for careful planning and oversight in DI initiatives [10, 14].

These case studies illustrate the dual nature of DI in practice: while successful applications can drive remarkable improvements in efficiency and customer engagement, failures often stem from a lack of strategic alignment, inadequate preparation, and ethical oversights. Organizations must learn from these examples, recognizing that thoughtful implementation and contextual awareness are crucial for harnessing the full potential of digital intelligence.

Psychological Influences: Following “False Prophets” and the Risk of Misguided Leadership

In the fast-paced world of digital intelligence (DI), companies often look to prominent industry figures who advocate for transformative DI strategies. These “false prophets” may present DI as a guaranteed solution for competitive advantage, yet following their advice without careful consideration can be misleading. This reliance on popular voices introduces several risks that can impede successful DI adoption:

1. Overpromising and Underdelivering: Influential figures frequently highlight the most optimistic outcomes of DI adoption, emphasizing how it can revolutionize customer engagement, boost profits, and streamline operations. However, this enthusiasm can lead to inflated expectations that, in reality, may be challenging to meet. When the anticipated gains fail to materialize, organizations face disappointment, wasted resources, and a diminished trust in DI's viability for their specific context [3].
2. Lack of Customization: Following trend-driven advice can often result in one-size-fits-all DI implementations that lack meaningful alignment with an organization's unique needs. When DI is implemented without customization, the solution may only partially integrate into existing systems or workflows, failing to address the specific objectives that prompted its adoption. This lack of alignment can render DI tools ineffective, limiting the benefits of DI investments and weakening the organization's competitive positioning [5].
3. Ethical Risks: DI strategies driven by FOMO or high-profile endorsements may encourage companies to overlook ethical considerations. Hastily implemented DI initiatives may not comply with data privacy regulations or may rely on biased algorithms, leading to ethically compromised decisions that risk reputational damage or legal repercussions. Such ethical lapses not only affect the organization but can also erode public trust in DI solutions, making future adoption more challenging [10].

Balancing Innovation and Prudence in DI Adoption

Navigating the complex landscape of DI requires a balanced approach that tempers the excitement of innovation with strategic forethought and continuous learning. This balance helps organizations mitigate risks while unlocking DI's true potential through the following measures:

1. **Developing a Strategic Roadmap:** A well-defined roadmap ensures that DI initiatives are purposefully aligned with the organization's broader business objectives. By setting clear goals and identifying necessary resources, organizations can avoid the pitfalls of hasty, reactionary DI adoptions.
2. **Implementing Pilot Programs:** Pilot programs allow organizations to test DI solutions on a smaller scale, providing an opportunity to assess performance, gauge integration capabilities, and refine the technology before committing to full-scale deployment. This cautious approach minimizes disruptions and allows for adjustments to be made before DI tools are rolled out company-wide [3].
3. **Fostering Continuous Improvement:** As DI technologies and methodologies evolve rapidly, maintaining a culture of continuous improvement is essential. Keeping teams informed of emerging DI trends, practices, and potential pitfalls empowers organizations to stay agile and make informed decisions that leverage the latest advancements while avoiding outdated approaches [13].
4. **Engaging Stakeholders:** Inclusive stakeholder engagement is crucial for achieving organizational alignment and ensuring smooth transitions during DI adoption. Open communication with stakeholders—both internal and external—supports effective change management, reinforces the strategic relevance of DI initiatives, and fosters a shared commitment to DI's responsible and productive use [6].

By balancing innovation with prudence, organizations can approach DI with a comprehensive strategy that reduces the risk of misaligned goals, ethical oversights, and unfulfilled promises. This measured approach enables DI to become a genuine asset, contributing

to sustainable growth and meaningful innovation in alignment with the organization's long-term vision.

CONCLUSION

Digital intelligence holds transformative potential for businesses by enhancing decision-making, customer engagement, and operational efficiency. However, the FOMO associated with DI can lead to rash decisions, over investment, and unrealistic expectations, compounded by psychological influences like jealousy and the Dark Triad traits. Moreover, the misguided belief that DI intrinsically fosters sustainability risks diverting attention from genuine sustainable practices. A strategic and measured approach to DI, coupled with mindfulness of psychological and practical influences, can help businesses avoid the pitfalls of FOMO while achieving sustainable, innovation-driven growth. In the dynamic landscape of modern business, the adoption of digital intelligence (DI) offers a transformative opportunity for organizations seeking innovation and competitive advantage. However, the rush driven by the Fear of Missing Out (FOMO) often leads to misguided implementations that can compromise effectiveness and ethical integrity. The influence of psychological factors, particularly those associated with the Dark Triad of personality—narcissism, Machiavellianism, and psychopathy—can exacerbate these challenges. Leaders embodying these traits may prioritize personal ambition and superficial successes over sustainable practices, potentially jeopardizing the organization's long-term viability and ethical standards. Contrastingly, the principles of Co-Dependent Anonymous (CoDA) advocate for healthier relational dynamics and personal growth within organizations. By fostering environments that emphasize collaboration, mutual respect, and collective well-being, businesses can mitigate the detrimental impacts of negative personality traits associated with the Dark Triad. CoDA's emphasis on accountability, open communication, and emotional support can facilitate a culture that values ethical decision-making and sustainability over the pursuit of short-term gains. To successfully navigate the complexities of DI adoption, organizations must strive for a balanced approach that integrates strategic planning, stakeholder engagement, and continuous learning. By embracing these principles and recognizing

the psychological undercurrents that influence decision-making, companies can harness the potential of digital intelligence responsibly and effectively. Ultimately, fostering a culture that prioritizes ethical practices and long-term sustainability will not only enhance business performance but also contribute positively to the broader societal landscape.

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Impact of Artificial Intelligence on Stock Market Predictions

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ABSTRACT

Artificial Intelligence (AI) has changed the traditional face of stock market predictions using AI algorithms to analyze big data. The AI to predict Stock Market Trends By consuming significant data sources from news articles, company financials and social media, coupled with machine learning techniques along with NLP (Natural Language Processing), AI can give predictions over the stock market trends. This ability to learn and improve its performance gives AI real value to investors. Nonetheless, many questions about the biases and hazards could arise if we only trusted AI for our stock market predictions. To sum up, the use of AI improved stock market predictions in terms of speed and precision but has limitations that we need to keep in mind & future performance should be under constant scrutiny.

KEYWORDS: *Artificial Intelligence, Stock market, Data, Predictions, Machine Learning.*

INTRODUCTION

The stock market is an exceedingly complicated and dynamic environment managed by many factors, including economic data, company-specific financial performance, and sentiment. It is a very unpredictable cryptocurrency, making its future behaviour somewhat challenging to predict [1]. Herein, as computational techniques began to rise in recent years, people started showing an interest in predicting stock market movements using these tools. When it comes to stock markets, machine learning is one of the most common techniques employed for prediction [2]. The Price Model is driven by machine learning algorithms trained with historical market data to uncover patterns and project closing stock prices. These powerful algorithms can process large datasets without bias or variance and adapt quickly to changing markets. For example, linear regression and support vector machines (SVM) are generally used for stock market predictions. In this case, linear regression seeks to identify the straight line that best supports or refutes the prediction of stock price trends. SVMs for Non-Linear Data — SVMs are usually robust with non-linear data and have performed well in predicting stock prices [3].

Sentiment-based Stock market prediction includes evaluating the overall market and public perception of a company, sector, or the broad market (e.g., stock versus shares). Sentiment analysis methods employ natural language processing and machine learning to track general sentiment about a company or the market across social media, news articles, and other data sources. This data can further refine the accuracy of stock market prediction models. Some of my blogs are Deep Learning in Stock Price Prediction, Introduction to Machine Learning, and Sentiment Analysis. Given the time-series data, deep learning algorithms such as Recurrent Neural Networks (RNN) seem promising for predicting stock prices [4]. These algorithms can identify intricate relations and patterns in data and learn from these to make predictions with high accuracy. Analyzing financial news articles and social media data to predict market movements using RNNs Quantitative techniques for predicting stock markets perform very well in practice [5]. These methods can tackle the problem of large and complex datasets, shift from one market condition to another quickly, and bring in sentiment analysis to enhance model predictions. However, it is said that the stock market is affected by

numerous unpredictable situations, and there isn't just any system or method for predicting reliability. That is why it is necessary to use a mixture of methods based on keeping up with competition and developing consistent prediction models [6].

Stock market prediction is one of the youngest and most striking fields that use computational techniques as an essential tool. These methods generally use some proprietary algorithm and a set of formulaic instructions to precisely analyze big stock market data to forecast its future behaviour. Abstract In this technical abstract, we will outline the advantages of employing computational methods for stock market predictions. In addition, the computational methods will allow us to predict stock markets more systematically and objectively [7]. Virtually all the old ways we understand how to investigate the proceedings on markets depend fundamentally on subjective elements like gut feelings and sentiment that can cause irrational forecasts. These techniques can process and analyze enormous quantities of intricate financial data from multiple sources. It gives a better sense of market trends and patterns, which benefit the investment. This can also help spot patterns and trends that would otherwise be invisible to the naked eye with real-time market data on a standalone basis. These methods can then predict possible market movements and trends, allowing investors to keep one step ahead in recognizing market changes. It also gives more accuracy in stock future prediction. These methods employ artificial intelligence (AI) based on brilliant algorithms and statistical models that can keep learning unhindered forever to get accustomed to prevailing market scenarios [8]. This leads to better predictions and less risk of losing money in the investment process. Thus, forecasting a stock market is much cheaper and more efficient. Conventional methods of market analytics need a lot of time and a qualified team, making them expensive and out-of-reach for many investors. Compared to that, computational methods are machine automated) and therefore makes the whole process faster and more manageable for mass market investors. Stock market predictions using computational approaches have many benefits: objectivity, comprehensive modelling, high accuracy, and efficiency [9]. In this constantly and continuously evolving stock market, these strategies

will prove very beneficial to any investor as they work on the principle of making decisions based on sound analysis in little time [10]. The main contribution of this paper is the following,

- The AI makes it much more accurate what the stocks will do on the stock market. These tools can process many data points and extract signals that even experienced human analysts could miss, providing more accurate predictions, as investors require, at an already advanced level.
- AI for Stock Market predictions also improved stock market operations. Conventional methods of past analysis in the stock market take time and resources to process data. When AI refreshes this same behaviour, it instantly processes a vast amount of information. This results in quicker decision-making and potential profits for the investors.
- Using AI in stock market predictions is another example of minimizing human error. Emotions and biases can often cloud human predictions, consequently delivering incorrect forecasts.
- AI for Stock Market Predictions can displace the human element and focus only on mathematical analysis based on pure data, resulting in more agnostic predictions leading to better investment success.

RELATED WORKS

AI has gained more attention as a method for stock-market prediction. This most conventional method relies on massive datasets and sophisticated algorithms to understand market trends and predict upcoming stock prices. Although this technology can transform the finance industry, numerous technical challenges should be addressed to work correctly and accurately [11]. These predictions are good, but then the central care turning point here is how accurate these predictions are, and this is directly affected by the type of data used for training these algorithms. This implies that the data must be both timely and relevant. The financial market data is a very swiftly changing domain, and collecting and maintaining it can be daunting to anyone [12]. Also, the absence of historical data for a few markets and certain stocks can affect the accuracy of the prediction. Many algorithms available in AI can be used to predict

the stock market, like neural networks, decision trees, genetic algorithms, etc. They all have pros and cons, so it is challenging to understand what algorithm should be used for a particular market or data set [13]. In addition, these algorithms require regular tuning and updates from new materials as they go along to ensure better predictions. It would help if you had expertise in financial markets and AI techniques. The stock market's volatility is due to various reasons, including economic or political events, social factors, and others, making them almost impossible to predict [14]. Therefore, even the most sophisticated AI algorithms may not be able to accurately forecast what can happen in the market in times of instability or uncertainty. Large-scale neural algorithms need high computing power, and hardware maintenance is expensive and complicated [15]. Processing on big datasets and real-time monitoring of market trends can also be complex. The never-ending updates, maintenance, and improvement improvements also increase complexity and operational costs. Even though AI in stock market predictions could be a game-changer for the financial domain, there are a few technical issues to resolve before deploying an error-free, accurate model [16]. This will consist of poor data quality and quantity, how to choose an algorithm/optimization hyper-parameter, the market coming into an irrational state or converting homework ideas for AI predictions output being able to place trades on them [17].

PROPOSED MODEL

The AI for Stock Market Predictions proposed is an impactful blend in bringing accuracy through Artificial Intelligence & Machine Learning Techniques for predicting the performance record of the stock market. Utilizing neural networks, the AI analyses large volumes of historical data and current trends on the market to detect similarities in patterns, leading to a high level of confidence that the price will move up or down. It constantly learns from its performance to centre the forecast on accurate and shifting market conditions. Advanced natural language processing algorithms also allow the AI to analyze market news and sentiment, which helps it consider a global view of the markets. This super AI could change how we analyze stock markets and give us hints to help investors with better decision-making.

Construction

The Input Stocks Data is the raw data from numerous sources, such as stock markets and financial databases. This data has information about the price, volume, and other market indicators for different stocks. This is followed by Feature Extraction, which involves identifying and extracting the essential patterns/features from the input data. This will allow us to have a much cleaner and more structured dataset that we can utilize for training and testing our model. The construction of the proposed model is shown in the following Fig.1



Fig. 1. Construction of proposed model

The training data is used to train a machine-learning model based on the patterns and features extracted from the input data. They are testing Data. This is to test the model and make any corrections. Finally, using the created model, you can use the Trained Data Results to predict future stock prices and details. These are used in stock trading to practice decision-making and spending. These are the insights and possible predictions to help investors make better-informed decisions for Predicted Stocks Data.

Operating Principle

AI in stock prediction fundamentally works around its ability to analyze gigantic numbers and figures related to financial data, market movements, and historical patterns in terms of the means to provide an allowed future performance state of stocks. The AI algorithms implement machine learning, natural language processing, and deep learning techniques to process and analyze this data in real-time.

Functional Working

The raw data is added to the feature expansion process by constructing derived attributes (e.g., moving averages) to train a predictive model. The functional working is shown in the following Fig.2.

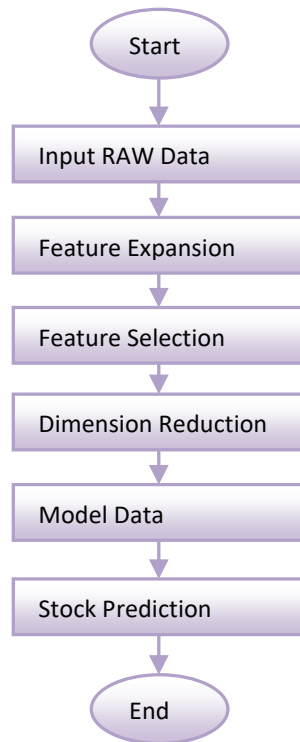


Fig. 2. Functional flow diagram

The Feature Selection is done to get all the best features for predicting the model. It allows for the elimination of noise and enhances the outcome. Dimensionality reduction- Use the reduction of dimension features in extensive data to avoid overfitting and apply different dimension reduction techniques. This improved data is used for prediction model training, which requires multiple steps of data processing, such as normalizing the data, splitting between train and test sets, etc. This trained model will start predicting future stock prices, with which we can evaluate or improve the output. It finally finished the process by using them to predict the stock prices and analyze how well our model performed. This gives hints for stock market predictions.

RESULTS AND DISCUSSION

To measure the success rate of predictions, The proposed AI algorithm on historical stock price data contrasts

its prediction with what happened to price action. The percentage of its successful predictions is informative regarding what this AI can do in the stock market. This is done by deploying the AI algorithm in a real-time market scenario and observing his predictions. Test the AI in real-time and see how it adapts to market changes as they happen and predicts the stocks.

Back-testing

The AI algorithm is tested against historical stock market data to see how accurately it predicted past market movements. This measures the AI's trustworthiness and dependability in predicting stock prices. Table.1 shows the performance comparison of back testing in different stocks.

Table 1: Performance results for Back-testing (in %)

Stocks	Accuracy	Precision	Recall	F1-Score
100	81.78	82.87	83.67	95.23
200	80.81	81.74	82.54	94.82
300	79.83	80.75	81.48	94.42
400	78.86	79.75	80.41	94.02
500	77.89	78.69	79.32	93.62

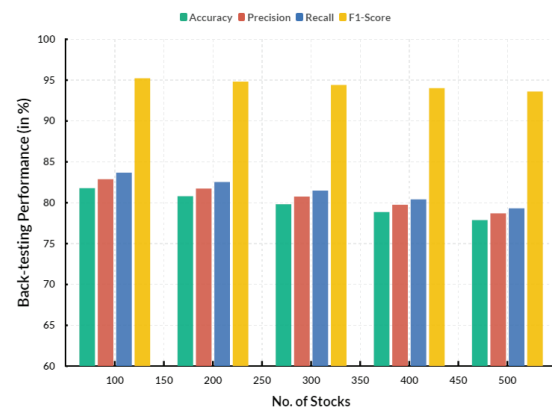


Fig. 3: Performance comparison of Back-testing.

Fig.3 shows the performance comparison of Back-testing. AI algorithms for stock prediction are back tested on the historical data to check whether these would have been able to predict future prices. It consists of input into the algorithm's market data verified with the past and evaluation of his performance in predicting. The Testing phase is used to catch any defects or advantages in the algorithm, which helps enhance its accuracy. The latter also serves as an approximation

for the algorithm's performance in real-time trading situations. This historical testing is essential to measure AI-based stock prediction models before putting them on the live market.

Stress testing

This test shows how the AI algorithm behaves in crazy environments where markets do things that have never been seen. This is crucial as the stock market can be very volatile and unpredictable. Table.2 shows the performance comparison of stress testing in different stocks.

Table 2: Performance results for stress-testing (in %)

Stocks	Accuracy	Precision	Recall	F1-Score
100	84.72	85.82	86.79	96.15
200	83.71	84.68	85.87	96.58
300	82.78	83.57	84.54	95.34
400	81.80	82.44	83.48	95.21
500	80.83	81.32	82.36	94.81

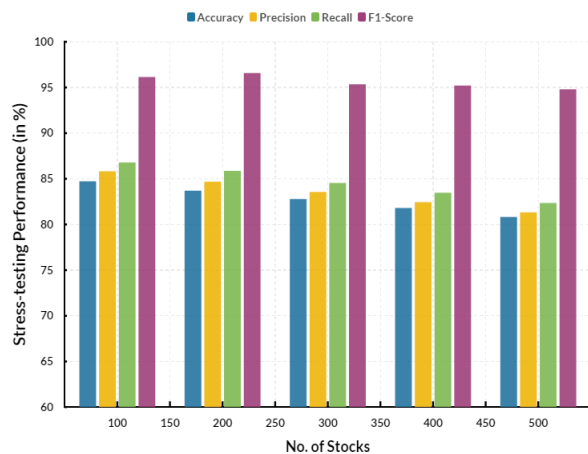


Fig. 4: Performance comparison of stress-testing

Fig.4 shows the performance comparison of stress testing. Stress testing is a method used to assess the performance of an AI algorithm during extreme or unexpected scenarios. In simplest terms of stock prediction, it means to test the algorithm by adding or creating significant stressors (sudden and unpredictable market changes), either significant events such as new positive news or unexpected negative/poor performance on sudden wrong trading portfolios. This is one way that it helps reveal the weaknesses or flaws in the algorithm and can lead to adjustments that will improve its overall

performance. In stock prediction, stress testing is essential because this puts the algorithm's capabilities to work under more realistic scenarios,, which will help reduce the risks of using AI in the market.

Cross-validation testing

This method takes your historical data, splits it into segments, trains the AI algorithm on one segment, and then tests it on a different segment. This provides a way to assess the AI's predictability over its generalization and homogeneity. Table.3 shows the performance comparison of cross validation testing in different stocks.

Table 3: Performance results for Cross validation testing (in %)

Stocks	Accuracy	Precision	Recall	F1-Score
100	87.71	88.60	90.40	98.28
200	86.21	88.01	88.53	97.24
300	85.10	87.03	87.70	97.11
400	83.73	86.31	86.18	96.37
500	82.43	85.53	84.83	95.79

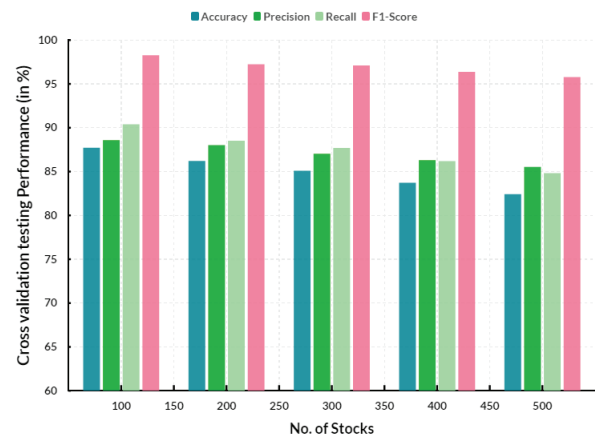


Fig. 5: Performance comparison of cross validation testing

Fig.5 shows the Performance comparison of cross validation testing. To detect this, cross-validation testing of the AI algorithm is applied to examine its predictive performance for stock prices. It is a method in which data is divided into groups used as the training and test sets. The model is trained in a training set and then tested with each test set, giving us several accuracies. This is also a way to check whether the AI algorithm has over fitted to the training data and how well it generalizes to testing datasets. It also serves to identify

the best parameters for that model, increasing efficiency on subsequent predictions.

Monte Carlo Simulations

This entails running many different simulations on different inputs to evaluate how the outcomes of the simulation vary and then analyzing whether an AI algorithm can predict these. It helps us measure the AI's robustness and reliability in predicting across scenarios. Table.4 shows the performance comparison of Monte Carlo Simulations in different stocks.

Table.4: Performance results for Monte Carlo Simulations (in %)

Stocks	Accuracy	Precision	Recall	F1-Score
100	82.42	85.52	84.83	95.79
200	81.12	84.74	83.48	95.20
300	79.81	83.95	82.13	94.62
400	78.51	83.17	80.78	94.03
500	77.20	82.38	79.43	93.45

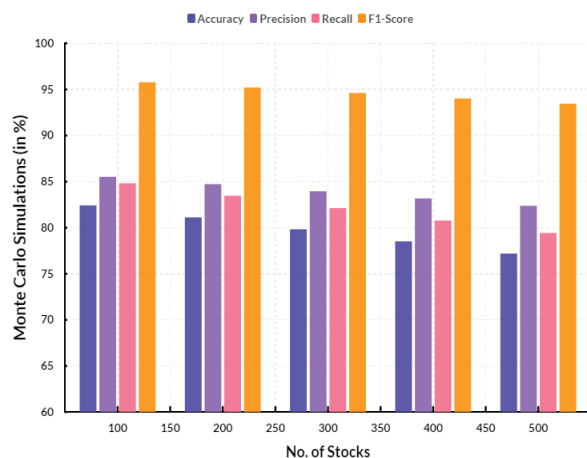


Fig. 6: Performance comparison of Monte Carlo simulations

Monte Carlo simulations are a probabilistic modeling technique that is used to simulate the potential outcomes of a system or process shown in the fig.6. For example, in the case of AI algorithms for stock prediction, Monte Carlo simulations can be utilized to simulate and forecast future price action created from historical data patterns and trends in the market. AI algorithms perform multiple simulations and analyze the results to identify patterns that will predict future stock prices more accurately. This form of prediction allows for a more dynamic

and adaptive way towards stock predictions, as it can consider several different possibilities for futures for its following inputs. Moreover, rate simulations through Monte Carlo analysis help mitigate risk and yield greater decision-making confidence in investments.

CONCLUSION

With the rise of incredibly sophisticated algorithms and superior computer systems, predictions based on stock prices have been made using AI more extensively than ever in recent years. Artificial intelligence is the technology used to analyze large amounts of data, find patterns, and make accurate predictions based on it. It is so big that it has completely revolutionized trading in the stock market, where traders and investors make data-driven decisions. AI in stock prediction has one of the significant advantages: it has the power to learn continuously from real-time market data and continue its learning process. That ensures better and more responsive forecasting, where the AI can make real-time predictions as the market circumstances change. It can even find hidden correlations and patterns within the data that human analysts may not see. AI also has flaws and may create errors in unpredictable markets. Note it also leverages historical data which may not be a perfect predictor for future events, especially black swan events. AI is an excellent tool for making stock predictions, but you should rely on something other than it because human judgment remains vital.

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The Necessity of the Hour is Work-Life Balance

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ABSTRACT

In today's constantly evolving world, the pursuit of work-life balance has become a prominent concern for individuals and organizations alike. This article explores why establishing harmony between professional and personal life is crucial, underlining its positive effects on mental well-being, job satisfaction, and organizational success. As individuals face increasing pressures—such as heightened workplace demands, the pervasiveness of technology, and societal expectations to stay productive at all times—many struggle to achieve a sense of balance. The article dives into the specific challenges that prevent people from effectively balancing work and personal responsibilities. Technological advancements, while enabling flexibility, also blur the lines between work and home life, creating a culture of constant availability. Additionally, rising productivity expectations make it difficult for individuals to disconnect from work, leading to burnout and stress. Beyond identifying these obstacles, the article highlights the extensive benefits of a balanced lifestyle, which include enhanced mental health, increased motivation, and stronger employee engagement. Research shows that when employees experience a sense of balance, they are not only more satisfied but also more productive, which ultimately benefits both their personal lives and the organization they work for. Retention rates improve as well, as employees who feel supported are more likely to stay long-term.

KEYWORDS: *Work-life balance, Well-being, Productivity, Workplace demand, Employee satisfaction.*

INTRODUCTION

As the distinction between work and personal life gets more blurred, the idea of work-life balance has changed from being a personal preference to becoming a crucial topic of conversation in today's culture. Finding this balance is not only beneficial for individual well-being; it has become a vital element of organizational success, influencing productivity, employee satisfaction, and long-term retention. With work-related stress and mental health concerns on the rise, there is a growing awareness of the impacts of overwork. Both employees and employers are recognizing that a balanced lifestyle is not just desirable but necessary for sustainable health and effectiveness. The significance of work-life balance is shown by research that demonstrates how long-term stress and a lack of personal time can result in burnout, low motivation, and mental health issues, which can

impact an employee's general performance and the work environment [1]. The shift to remote work has amplified this challenge. While working from home offers flexibility, it also makes it harder for individuals to disconnect. Technology, which allows constant connectivity, blurs traditional work boundaries even further. Many employees feel an implicit expectation to be always accessible, responding to emails and messages well beyond typical working hours. This persistent connectivity erodes the boundary between professional obligations and personal time, making it challenging to achieve any sense of true separation. The urgency of addressing work-life balance in contemporary society cannot be overstated. Organizations that actively promote and support balanced lifestyles are not only fostering healthier, happier employees but are also laying the foundation for sustainable productivity. A work environment that values and respects boundaries

cultivates a culture of trust, enhances job satisfaction, and significantly reduces turnover rates.

REVIEW OF LITERATURE

Recent studies on work-life balance (WLB) continue to underscore its importance in promoting employee well-being, organizational commitment, and productivity. Studies from 2020 to 2024 highlight the growing influence of technology, remote work, and globalization on employees' ability to balance work and personal life, with each posing both opportunities and challenges in managing work-life boundaries effectively.

Technology, for instance, has significantly redefined work environments, enabling remote work and flexible schedules but also leading to increased work encroachment on personal time. Dwivedi et al. [2] (2021) discuss how digital tools and remote platforms allow for flexibility but can blur the separation between work and personal time, especially when organizational expectations for constant connectivity exist. Organizations that implement clear remote work policies with HR oversight can better support employees in managing these boundaries, reducing burnout, and enhancing well-being.

The concept of work-life balance has evolved into a core expectation among employees, who prioritize flexible working conditions, mental health support, and meaningful engagement with their work. A 2023 review highlights how HR departments now play a central role in structuring WLB policies, offering flexible schedules, and establishing wellness programs to meet these new demands. According to Naskar [3] (2023) and others, companies that use flextime, shortened workweeks, and clear remote work regulations not only improve employee satisfaction but also boost performance and retention.

Globalization has further introduced cross-cultural diversity into the workplace, requiring organizations to consider differing employee expectations around work and family life. Ferreira-Lopes & Van Rompay-Bartels [4] (2020) argue that culturally adaptive WLB policies help in building inclusive and supportive workplaces, where flexibility in working hours or location accommodates diverse needs, contributing to organizational resilience and employee engagement.

WORK-LIFE BALANCE

The equilibrium between professional and personal duties that enables people to efficiently manage their time in order to meet both sets of responsibilities is known as work-life balance. Setting boundaries, managing time, and prioritizing both personal and professional objectives are just a few of the many components it includes. Maintaining one's physical and mental well-being, cultivating interpersonal relationships, and guaranteeing job satisfaction all depend on striking this equilibrium.

A well-balanced life encourages individuals to thrive in their careers while enjoying their personal pursuits, leading to a more fulfilled existence.

Effective time management is only one aspect of a healthy work-life balance; another is developing a mentality that places equal importance on personal time and professional success. Employees who engage in hobbies, spend quality time with family, and prioritize self-care tend to be more resilient and focused when they return to work. Moreover, organizations that acknowledge and support this balance create environments where employees feel valued and motivated.

THE EFFECT OF WORK-LIFE BALANCE

The effects of a healthy work-life balance extend beyond individual well-being; they significantly influence workplace dynamics. Employees who achieve balance report higher job satisfaction, increased productivity, and reduced burnout [5]. According to studies, people who successfully balance their personal and professional obligations are less likely to suffer from chronic stress, which improves their general health.

Organizations benefit as well, experiencing lower turnover rates and higher employee engagement. Research by the American Psychological Association highlights that companies promoting work-life balance enjoy a positive reputation, making them more attractive to potential hires. In contrast, workplaces that neglect this balance often face high attrition rates and diminished morale.

Mental Health Implications

Mental health plays a pivotal role in achieving effective work-life balance. Excessive work demands and stress can trigger serious mental health challenges, such as anxiety and depression. In contrast, balanced work and personal time support emotional resilience and promote overall well-being. Employees who work in environments that promote support and balance are more likely to ask for assistance when necessary, which eventually helps to create a more upbeat and health-conscious work environment.

TYPICAL REASONS WHY WORK-LIFE BALANCE IS LACKING

Several factors contribute to the lack of work-life balance in today's workforce. Understanding these barriers is essential for addressing the issue effectively:

Technology: The accessibility provided by smartphones and email often causes a blur between professional and personal life. Many employees feel compelled to respond to work-related communications outside regular hours, resulting in a continuous state of work engagement.

Cultural Expectations: In numerous sectors, a culture of long hours remains synonymous with commitment and success. This perspective may compel employees to prioritize work at the expense of their personal lives, creating a pressure to sacrifice personal time for career advancement.

Job Insecurity: Economic uncertainties can make employees prioritize work over their personal life due to concerns over potential consequences for taking time off or requesting flexibility. This job insecurity may lead to burnout and workplace resentment.

Lack of Policies: Organizations may lack clear policies that support flexible work arrangements. Without management support and clear guidelines, employees often find it challenging to establish the balance they need between work and personal obligations.

ADVANTAGES OF A BALANCED WORK-LIFE

Achieving work-life balance yields numerous benefits:

Improved Mental Health: Reduced levels of stress and anxiety lead to better mental health outcomes. When

employees have the opportunity to recharge and engage in personal activities, their overall well-being improves.

Enhanced Productivity: Maintaining a work-life balance helps employees be more creative and solve problems more effectively, which makes them more focused and productive during working hours.

Stronger Relationships: Time allocated to personal life supports the development of stronger bonds with family and friends. Employees who prioritize their personal lives return to work feeling more fulfilled and motivated.

Higher Job Satisfaction: A balanced approach to work leads to greater job satisfaction and loyalty. Employees who feel supported in their efforts to achieve balance are more inclined to remain with their organization long-term.

ENHANCING THE WORKPLACE'S WORK-LIFE BALANCE

To foster work-life balance within an organization, several strategies can be adopted:

Flexible Work Hours: Offering employees flexibility in choosing their work hours can help them better manage personal commitments, reduce stress, and improve morale.

Remote Work Options: Providing remote work possibilities can alleviate commuting stress and enhance productivity. By allowing work from home, organizations support a healthier work environment.

Wellness Programs: Programs that support both mental and physical health, like stress management, mindfulness, and fitness, can significantly improve the general well-being of employees.

Encouraging Time Off: Cultivating a culture that values time off helps employees recharge without feeling guilty. Organizations should actively promote the use of vacation days and personal time to help prevent burnout.

CONCLUSION

In conclusion, work-life balance is not merely a personal issue; it is a vital component of a healthy and productive workforce. As the demands of modern life

continue to escalate, prioritizing work-life balance becomes increasingly essential for both individual well-being and organizational success. By fostering an environment that values this balance, employers can enhance employee satisfaction, productivity, and overall workplace morale. The necessity of work-life balance is clear; it is not just a benefit but a crucial aspect of a thriving workforce.

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A Bibliometric Study of the Evolutionary Patterns of Academic Gaming Elements

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ABSTRACT

Due to its potential uses and advantages in virtually every area of education, gamification is an extremely popular concept that is overgrowing. By calculating the most pertinent journals, authors, documents, and country articles, the main objective of this research is to give a bibliometric analysis of studies linked to the growth of gaming aspects in the education sector. To do this, we examined English-language papers from Scopus databases on the evolution of gaming components in academic research. The results of the search revealed that Dicheva Dand and Dichev C are the writers who are most pertinent, and American authors obtained the most citations. Technology development improves articles on gamification. The outcome also demonstrates that game design, engagement, self-determination theory, education, and motivation are the hot subjects in this field. Future researchers can utilize the conclusions of this work as a template for selecting their gamification research topic.

KEYWORDS: *Gaming elements, Bibliometric analysis, Academics.*

INTRODUCTION

Gamification is a new and rapidly growing trend impacting a wide range of areas, such as education [1], marketing, personal development and others.[2] Game - based learning is a very novel invention that hasn't received much attention from academics research and investigation. It is described as the application of game techniques and components to non-gaming contexts[3].It includes providing badges, points, stickers, leader board and creating direct competitions in non-game environment to engage the users[4]As digital technologies are spreading rapidly, higher education institutions must embrace these developments to meet the needs of their learners[5] The elements and characteristics of the games have a fundamental part in the gamification[6].It is usually defined as the use of 'game-based mechanics, aesthetics and game thinking to engage people, motivate action, promote learning and solve problems. Application of gameplay elements and approaches in education has a significant number of the supporters because it, to a certain extent, solves the imperfections of e-learning education. [7]The use of gamification software and technology the student

assessment and evaluation plays a significant role in student engagement[8]. It will be worthwhile to study the trendy topic[9] of Gamification in particular sectors. So, we decided to study the progress of research on gamification relating to the education sector[10][11].

Research questions

- What is the current trend of research on Gaming Elements relating to the education sector?
- What are the emerging keywords in the literature of Gaming Elements for future researchers?

RESEARCH METHODOLOGY AND DATA COLLECTION

The research methodology in the aspects relevant to gaming elements in the education sector was evaluated using the bibliometric analysis approach. It is a systematic approach that examines the patterns of writers', publishers', and records' publications[12]. The Scopus database conducted a search using the English language "Gaming Elements" AND "In" AND "Academics" were the search phrases. The Scopus database was automatically searched for the study's

time period from 2011 to 2023 without regard to the subject matter, location, or document type. The database produced 221 documents in CSV format related to developments of Gaming Elements in Academics. R-Studio was the program used for the data processing.

DATA PROCESSING AND FINDINGS

Descriptive analysis examines bibliometric data in terms of the data set's essential characteristics, such as (1) sources/journals (2) authors, and (3) documents.

Table 1 Main Information of Data

Description	Results
Time span	2011:2023
Sources (Journals, Books, etc)	154
Documents	221
Average years from publication	3.13
Average citations per documents	22.7
Average citations per year per doc	3.836
References	8477
DOCUMENT CONTENTS	
Keywords Plus (ID)	944
Author's Keywords (DE)	601
AUTHORS	
Authors	642
Author Appearances	682
Authors of single-authored documents	25
Authors of multi-authored documents	617
AUTHORS COLLABORATION	
Single-authored documents	26
Documents per Author	0.344
Authors per Document	2.9
Co-Authors per Documents	3.09
Collaboration Index	3.16
Description	Results
Collaboration Index	2.91

Table 1 shows that between 2011 and 2023 221 documents were published by 642 authors wherein 25 are authors of single authored documents and 617 are authors of multi-authored documents. Authors per document are 2.9 and documents per author are 0.344. Average citations per document stands at 22.7.

Table 2 Most Relevant Sources

Rank	Sources	Articles
1	Proceedings of the European Conference on Games-Based Learning	10
2	ACM International Conference Proceeding Series	9
3	IEEE Global Engineering Education Conference Educon	6
4	Lecture Notes in Computer Science (Including Subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	6
5	Proceedings of the 11th European Conference on Games Based Learning ECGBL 2017	6
6	International Journal of Emerging Technologies in Learning	5
7	Electronic Journal of E-Learning	4
8	ASEE Annual Conference and Exposition Conference Proceedings	3
9	CEUR Workshop Proceedings	3
10	Computer Applications in Engineering Education	3
11	Computers in Human Behavior	3
12	Education and Information Technologies	3
13	International Journal of Human Computer Studies	3
14	Lecture Notes in Networks and Systems	3
15	Proceedings of the Annual Hawaii International Conference on System Sciences	3

The table lists the 15 most relevant sources from the year 2011 to 2023. Proceedings of The European Conference on Games-Based Learning has published the highest number of articles. 9 articles were published by the ACM International Conference Proceeding Series. IEEE Global Engineering Education Conference Educon, Lecture Notes in Computer Science (Including Subseries Lecture Notes in Artificial Intelligence And Lecture Notes In Bioinformatics), Proceedings Of The 11th European Conference On Games Based Learning EcgbL 2017 published 6 articles each. These are the major publications in the literature of development trends of gaming elements in academics.

Table 3. Most Relevant Authors

Rank	Authors	Articles
1	DICHEVA D	5
2	DICHEV C	4
3	GUY B	3
4	[NO AUTHOR NAME AVAILABLE]	2
5	CANO ASH	2
6	CARRILLO DL	2
7	CASSELLS T	2
8	CHUANG T-Y	2
9	COSTA FA	2
10	DOMÍNGUEZ-AMARILLO S	2
11	DR	2
12	ELGRABLY IS	2
13	FISCHER H	2
14	FOTARIS P	2
15	GARCÍA AC	2

The above table shows the most relevant authors in literature of development trends of gaming elements in academics. Dicheva D published the maximum articles followed by Dichev C (4 articles) and Guy B (3 articles). Other authors namely Cano Ash, Carrillo DL, Fischer H published 2 articles each.

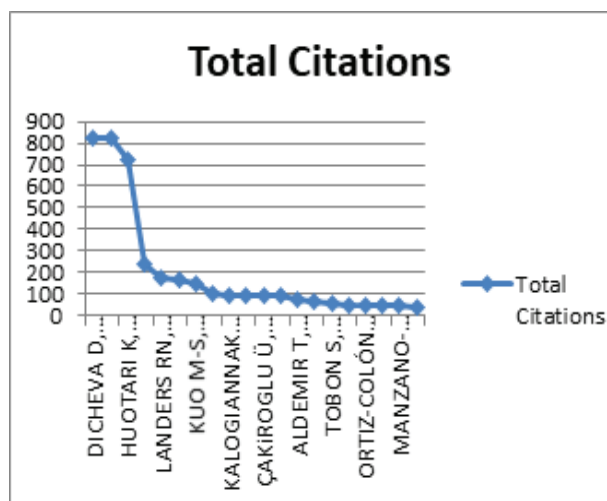
**Fig 1. Most Global Cited Documents**

Figure 1 represents 15 most global cited documents. The most cited document in the development trends of gaming elements in academics is given by Dicheva D

in 2015 with a total 824 citations. The article given by Hanus MD comes close with 822 citations.

Table 4 Most Cited Countries

Rank	Country	Total Citations
1	USA	2772
2	PORTUGAL	168
3	TURKEY	160
4	CHINA	149
5	SPAIN	143
6	ITALY	115
7	UNITED KINGDOM	113
8	GREECE	101
9	CANADA	50
10	CHILE	39
11	AUSTRALIA	35
12	KOREA	32
13	AUSTRIA	24
14	GERMANY	23
15	THAILAND	16

Table 5 Countries Frequencies

Rank	Region	Freq
1	USA	81
2	SPAIN	77
3	UK	49
4	MALAYSIA	39
5	BRAZIL	36
6	GERMANY	30
7	CANADA	25
8	MEXICO	21
9	TURKEY	19
10	PORTUGAL	18
11	CHINA	14
12	ECUADOR	13
13	INDIA	13
14	IRELAND	12
15	ITALY	12

Table 4 lists top 15 cited countries in the literature of development trends of gaming elements in academics. USA has the majority of the citations at 2772. Total citation of Portugal is 168 followed by Turkey (160),

China (149) and Spain (143). Table 5 shows that besides having the most citations, USA is the most frequent also. Spain, UK, Malaysia and Brazil follows USA in terms of country specified frequency.

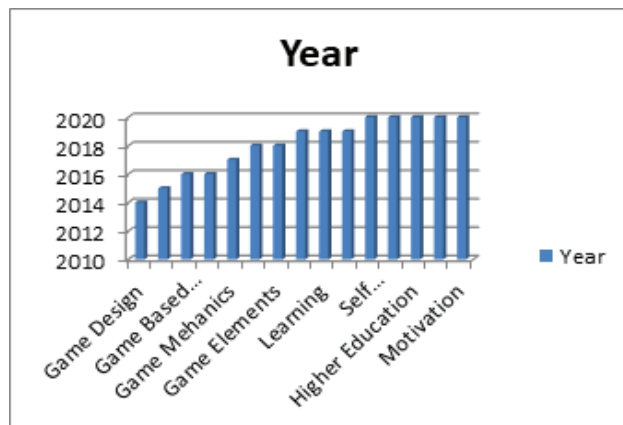


Fig 2. Trends Topics

The above figure represents the trend topics in the literature of development trend of gaming elements in academics from 2012 to 2021. The topic 'games' is trending since 2014. 'Game design' was in trend from 2012 to 2019. Other trend topics include e-learning, gamification, higher education.



Fig 3. Word cloud

The Word Cloud exhibits the frequently used keywords of a given topic. The above Word Cloud indicates that Students is the most used keyword in the developing trends of gaming elements in academics. Other important keywords are motivation, teaching, e-learning, education, academic performance and computer aided instruction.

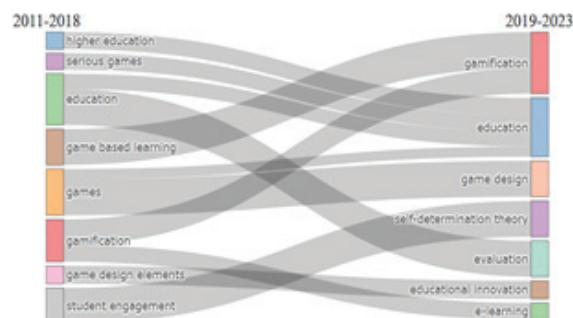


Fig 4. Thematic Evaluation

The above figure display the thematic evolution of the developing trends of gaming elements in academics during 2011-18 and 2019-23. From 2011-2018, the research focused on higher education, game based learning, games, gamification among others. From 2019-2023, the research focused on game design, self-determination theory, evaluation etc. Gamification and education remained the common topic throughout the time period.

DISCUSSION AND CONCLUSIONS

By utilising various databases, the bibliometric research aids in identifying the qualitative, conceptual, cognitive, and sociological theories in many domains. Using bibliometrics software, we examined journal development, publication study, writer assessment, co-citation assessment, co-occurrence of editor's words, top cited nations, nation production, word cloud, theme evolution, and emerging subjects. Research has shown that, before to 2011, the total production of publications in the field on development of gaming elements was negligible. In the past few years, studies on Gamification in the Education sector have become more popular. The study's findings made it abundantly evident that the USA ranked top for country-specific productivity and number of citations Higher Education, Gamification, Game based learning, serious Game and game design elements have been identified as the most significant research terms in the literature on development of gaming elements in academics for the conceptual evaluation. The prominent use of keywords such as Academic Performance, E-learning, Education Computing etc. was also highlighted using word cloud

analysis. The findings also revealed that Motivation, Education, Engagement, self-determination Theory and Gamification were hot issues in the literature on Gaming Elements in Academics. One could draw the conclusion that there is a huge area of Gamification study in the Education Sector and other industries. The outcomes of thematic analysis, word clouds, and trending topics all point to Gamification, Game-based learning, and motivation as the three most prevalent themes in the research on development of gaming elements in the education sector. Future scholars can examine Gamification in a variety of fields and on terms like game-based learning and others that have been cross-verified using thematic and trending subject analysis. It may be fascinating to expand on the research by including more databases, such as the WOS and Ebsco databases, in the comparative analysis or by performing a citation study equivalent to that used in other disciplines.

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A Demographic Analysis of Investment Preference of Government College Teachers in the Sagar District of Madhya Pradesh

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ABSTRACT

The pace of any country's economic growth and prosperity highly depends on the rate of investment. An increase in investment makes a direct contribution to the growth of the GDP of a nation. More investment leads to increased capital formation, which boosts economic growth. There are a variety of investment options available in the market for investors. The study has been conducted on the investment preference of government college teachers in the Sagar district, Madhya Pradesh focussing on how various demographic factors shape their investment decisions and preferences. The present descriptive-based research was confined to a total sample size of 100 and a structured questionnaire was used to get primary data using a convenience sampling technique. The findings reveal that the most preferred investment option among the teaching community is fixed deposits and bank deposits. Most of the teachers of government colleges would like to invest their money in a safer environment with the lower risk involved. The study concludes that a proper understanding of various demographic factors and their effect on investment behaviour would help policymakers in designing more innovative and tailor-made financial products, particularly in the education sector, which contributes significantly to economic progress.

KEYWORDS: *Investment preference, Investment avenues, Economic growth, Education sector..*

INTRODUCTION

The financial services industry has witnessed tremendous growth over the last few decades, and it is providing a wide range of investment options to many investors. Every investor's main aim is to maximize returns while minimizing risk. With effective financial planning and the selection of the right kind of financial product, investors can increase their wealth and contribute to economic growth [1]. A high rate of investment promotes capital formation, which significantly contributes to the economic growth and prosperity of nation. Investment is an important financial

asset for investors to acquire more returns in the future based on the capital employed in different investment avenues like fixed deposits, share markets, mutual funds, insurance policies, etc. In the words of Sharpe and Alexander, the term investment means "Sacrifice of certain present value for some uncertain future value" [2]. Many factors influence investor's behaviour and a demographic factor is among them [3]. Individuals using their intellect reasonably, select among different alternatives and realistically while making their investment decisions [4]. Some of the major investment options for investors are fixed deposits, mutual funds, the

share market, insurance plans, bank deposits, SIPs post offices, etc. People in the government sector, especially those who teach and are involved in the education sector are viewed as risk-averse investors because of their consistent preference for more secure investment options. Most of the government-employed people in the education sector especially, are keeping money in bank accounts to protect themselves against any future uncertainties. Bank deposits are the most preferred type of investment, among government college employees with the main objective of long-term savings to meet the expenses incurred on children's education, marriages, retirement security, etc. [5]. Many factors affect investment decisions, such as risk and return involved in investment, the percentage of the amount invested and the purpose of investment, the choice among the different types of investments, etc. The primary concern of investment is to maximize return and is to minimize risk [6]. The growth pace of any economy depends on investment, saving, and the rate of capital formation. The most important issue for developing countries is how to increase the level of savings and mobilize funds to increase investment. [7]. Investment behavior is an essential part of financial planning and financial companies must provide more need-based innovative financial solutions. The present study was conducted on government college teachers because of their financial stability due to regular income and job security. The underlying objective is to understand and analyse how various Demographic factors like age, income, gender, and level of education have an impact on the investment choices and preferences of government college teachers in the Sagar District of Madhya Pradesh. The study will provide valuable insights into how this particular segment of the population makes investments and approaches long-term financial planning.

REVIEW OF LITERATURE

When the authors conducted a study, there was frequent investment activity, thus confirming that it depends on the awareness of investment opportunities. The respondents claimed that safety was their primary concern when choosing any investment options [8]. Another study of the Akola district, Maharashtra based on government employees found that the majority of people give safety to the prime concern, followed by

lesser risk and more returns while making investments in any portfolio [9]. The primary concern of the teachers for choosing any investment option was safety. According to [10], a study conducted on various higher education institutions in Warangal City revealed that financial literacy and awareness are correlated with socio-demographic factors; a linear positive correlation was shown between the literacy level and education and income. When the investment behaviour of college faculty members in the Pondicherry region was studied, the findings concluded that the most preferred investment avenues were GPF and CPF (General Provident Fund and Central Provident Fund), and a lack of awareness about investment options like equity, mutual funds, and derivatives [11]. In one more study of the preference and perception of salaried employees of Rajkot district, Gujarat, towards various investment avenues, the findings revealed that investors prefer any investment avenue intending to minimize risk and maximize returns [12]. The study was further extended by another author, and the investment preferences of government employees were studied. The application of the Chi-Square Test revealed that government employees' most preferred choice of investment is the one that gives risk-free returns and despite being salaried and well-educated; they prefer to invest in the safest option available to them [13]. Gender differences also influences investment behaviour and most of the studies reveal that male investors are more risk-takers and are more confident while making investment decisions as compared to females who are more cautious and prefer less risky investment products [14]. More educated investors have better knowledge and skills, and therefore they are willing to take more risk than those with lower levels of education. People's income is also one of the critical factors affecting investment behaviour. Most people with high income would like to take more risk than those with less income [15].

Study's Contribution

Investment plays a key role in the progress and development of any nation. India is one of the largest populated countries in the world, and people's patterns of investment are one of the critical deciding factors in a country's overall growth. In viewing this, the present study has been undertaken to analyze the investment

preference or pattern of people engaged in government jobs, particularly government college teachers who receive a fixed monthly income. The significance of this research is found in the fact that government teachers are salaried individuals in society and, like other professionals, need to secure their financial position and future. Understanding different investment opportunities and creating awareness among them will not only help them but also help boost the economy of the nation. Moreover, teachers are supposed to be role models in society; thus, their demonstrated financial behaviour can influence large sections of society to further indulge in the different investment opportunities available. Understanding the investment preferences and behaviour of investors towards various investment avenues will help financial companies come up with more need-based financial solutions and thus increase the level of investment and economic growth of our nation.

Study's Objectives

1. To analyze the preferences of government college teachers regarding various investment avenues (fixed deposits, insurance policies, SIP, the share market, mutual funds, etc.) in the Sagar district.
2. To examine the relationships between demographic variables (age, income, gender, family income, and education) and investment decisions.
3. To provide valuable suggestions for improving investment decisions made by government college teachers.

Hypotheses

H₀₁: There is no significant difference in the preference of government college teachers in the Sagar district towards various investment avenues (fixed deposits, insurance policy, SIP, share market, mutual funds, etc.).

H₀₂: There is no significant association among various Demographic variables like age, income of family, gender and level of education, and the investment preferences of government college teachers.

RESEARCH METHODOLOGY

This study utilizes both primary and secondary data. A structured questionnaire was administered to 100

government college teachers working in the Sagar district of Madhya Pradesh, covering questions related to their income, age, investment preferences, education level, and so on. The study adopts a quantitative approach with statistical analysis using the Chi-square test and descriptive statistics for the purpose of data analysis using SPSS software.

ANALYSIS

Descriptive Results

The study sample consists of 100 government college teaching employees, with the following characteristics:

Table 1. Demographic details of the Respondents

Demographic Variables	Options	Nos. of respondent
Age (years)	21-30 years	09
	31-40 years	24
	41-50 years	36
	51-60 years	31
Income	Less than 5 lakhs	Nil
	5-10 lakh	22
	11-15 lakh	38
	15-20 lakh	34
	Above 20 lakhs	06
Gender	Male	47
	Female	53
Education Level	UG	Nil
	PG	18
	M.Phil.	28
	Ph.D.	50
	D.Litt.	4

Source: Compiled from the Survey data

The above table no.1 shows the demographic profile of respondents which reveals that 50 per cent of the respondents possess a Ph.D. degree. Majority (38%) of respondents lies in the range of annual income between 11 lakhs to 15 lakhs. The largest age group (36%) falls between the age group of 41 to 50 years. For gender, it shows 53 per cent respondents are females and the rest 47% are males.

Table 2. Investment Preferences towards various Investment Options

Investment options	N	Mean	S. D
Share market	100	3.06	1.376
SIP	100	3.14	1.443
Post office	100	2.78	1.404
Bank Deposits	100	3.36	1.352
FDs	100	3.46	1.417

Source: Primary Data

The above table no. 2 shows descriptive statistics values of mean and standard deviation for the investment preferences across different options. Fixed Deposits (FDs) are the most preferred option among Government college teachers with a mean of 3.46, and bank deposits came in second with a mean of 3.36. Systematic investment plans (SIPs) of mean 3.14 and a mean of insurance policies is 3.08 are also preferred. Post office saving means (2.78) and mutual funds mean (2.04) are less preferred. While the share market with a mean value of 3.06 has a moderate interest. Thus, we can say that investment in fixed deposits is the most preferred choice among the respondents because of more safety and security, whereas mutual funds are shown as the least preferred investment option because of lack of awareness and risk factors involved in it. The investment preferences of government college teachers in the Sagar district show varying levels of preference across different options. The table below shows values of mean and standard deviation for different investment options like FD, mutual fund, bank deposit, SIPs, Insurance etc.

Table 3. Friedman Test Statistics

	Value	N	Asymp. Sig. (2-sided)
Pearson Chi-Square	28.33	100	0.000

Source: SPSS Output

The above table no.3 shows the calculated chi-square value is 24.33, at a significance level of 5 % with a significance value of 0.000. This value is lesser than the standard p-value of 0.05. As a result, we can reject the null hypothesis and conclude that there is a significant difference in Government College teachers' preferences towards the various investment options such as fixed

deposits, insurance policies, SIPs, share markets, mutual funds, etc.

INFERENTIAL RESULTS

The present study is highly relevant as its emphasis on influence of various demographic variables on financial investment decisions. The table no. 4, indicates the results of the inferential results of the Chi-square test, which tells a relationship between age, income, gender, education, and investment preference. The calculated chi-square value between age and investment preference is 12.34, at a significance level of 5% with a significance value of 0.065. The value is higher than 0.05 (p-value). Therefore, we can accept the null hypothesis and interprets that there is no association or relationship between Age and investment preferences. This means age does not play a role in influencing an investment decision. The calculated chi-square value between income and investment preference is 15.23, at a significance level of 5 % with a significance value of 0.034. Here the significance value is 0.034 which is less than the standard p-value 0.05. So, we can reject the null hypothesis and understand that there is a significant association between income and investment preferences. This means income significantly influences investment preference and plays an important role in shaping investment decisions.

Table 4. Chi-square Test Results

Pearson Chi-Square	Value	N	Asymp. Sig. (2-sided)
Age and Investment Preference	12.34	100	0.065
Income and Investment Preference	15.23	100	0.034
Gender and Investment Preference	12.52	100	0.015
Education level and Investment Preference	18.45	100	0.008

Source: SPSS Output

The computed chi-square value between gender and investment preference is 12.52, at a significance level of 5 % with a significance value of 0.015. This value

is lesser than the standard p-value of 0.05. Therefore, we can reject the null hypothesis and find that there is an important link between investment preferences and gender. This means gender significantly influences investment preference and plays a critical role in investment decisions. The association between the level of education and investment preference is 18.45, at a significance level of 5% with a significance value of 0.008. A lesser p-value than standard p-value 0.05 indicates rejection of the null hypothesis. This means there is a significant association between level of education and investment preferences.

HYPOTHESIS TESTING RESULTS

It is clearly inferred from the table no. 4, which denotes results of chi-square test for various demographic variables and its association with investment preferences. The p-value for different variables such as income, gender, and education level were tested at a 5% level of significance and all were found less than the standard p-value i.e. 0.05. Only the variable Age was showing p-value greater than 0.05 at a significance level of 5%. Thus, we can conclude, that all the demographic variables are significantly associated with the investment preference except age which does not influence the investment preference of government college teachers. The Friedman test also showed a p-value lesser than 0.05 at a significance level of 5%. Thus indicating a significant preference towards various investment options available to respondents. The research findings can guide policymakers and financial institutions to come up with more customised financial products to satisfy diversified needs of customers and also bring more awareness of financial products giving higher returns like SIP and Mutual funds options.

CONCLUSION AND FUTURE RESEARCH

The study concludes that government college teachers in the Sagar district have a greater preference for low-risk investment options like fixed deposits and bank deposits. Various demographic factors like income, gender, and education level have shown a significant association with investment preferences. Age is the only factor that does not influence their investment decisions. This indicates a more conservative investment approach wherein more importance is given to financial security

and risk aversion. So, there is a need to spread more financial awareness and literacy on options giving more returns, like mutual funds, share markets, SIPs, etc. These new investment options will be able to empower investors to better manage risks, receive higher returns in a short period, and achieve financial goals in a rapidly evolving landscape. The study is confined to only demographic factors influencing investment decisions. It lacks in-depth analysis of other behavioural factors like financial literacy, risk perception, and many psychological factors such as risk tolerance, emotions, etc. also play a crucial role in investment decisions. The study mainly focused on the investment preferences of government teachers, which do not cover people involved in other occupations like the private sector, self-employed, etc. which could provide a broader understanding of investment behaviors across different demographics. The study suggests that through more financial awareness and literacy, educators would be able to have more diversified investment choices, which would contribute not only to individual financial growth but also to broader economic development.

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A Review of the Factors Influencing Mindfulness in Digital Learning

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ABSTRACT

Digital learning has become ubiquitous, and most people rely on this to enhance their skills by accessing the required courses using handheld devices. However, the drop-out rate is very high compared to the completion rate. Among many factors that determine the efficiency and success rate of digital learning, mindfulness is a highly significant element linked to the productive functioning of an individual. Mindfulness is an indispensable tool that will help students to become successful learners. Therefore, evoking mindfulness will enhance the productivity of digital learners. Hence, this research paper aims to identify various components impacting mindful learning in the digital era. The literature review is the research methodology adopted. The objectives of this review paper are to elaborate on a range of factors that would influence the mindfulness of digital learners and identify strategies to improve mindfulness in the digital learning environment. The factors found in this research can be categorised into different domains. Moreover, this study offers valuable insights that would enable digital course providers, educational institutions, companies, and independent learners to devise a digital learning environment fostering mindfulness, leading to overall student well-being and better learning outcomes.

KEYWORDS: *Mindfulness, Digital learning, Online learning, Engagement, Mindlessness.*

INTRODUCTION

The advent of internet technologies has revolutionised the education system. Even in the classrooms, hybrid learning is on the rise, and teachers are instructed to use information and communication technologies (ICT), enabling collaborative learning and long-term access to information. They must incorporate modern pedagogy methods and digital technologies in their teaching practices. The digital learning initiative (DLI) transformed traditional teaching methods. Additionally, flipped environments are becoming common, and students will be imparted information prior to the classroom session, enabling them to utilise the class

hours for activities. These novel learning systems impose nuanced schemes for collaborative learning, guidance, and supervision for synchronous and asynchronous learners.

Moreover, individuals enrol for more courses online as they are highly concerned with reskilling and upskilling. In India, the online user penetration will be 12.1% by 2024, which is expected to increase to 18.8% by 2029 [3]. According to the World Economic Forum estimate, 50% of the existing workforce requires reskilling due to adopting novel technologies [4]. Most of the digital learning takes place without supervision, thus requiring voluntary focus and motivation from the participants.

In addition, mindfulness ability (MA) moderated the relationship between technological self-efficacy and the effectiveness of online learning (EOL) [5]. Hence, mindfulness is essential in determining learners' potency in the online learning environment.

Mindfulness is a conscious psychological state emphasising attentive listening and awareness [6]. It has numerous benefits: (i) it generates more favourable outcomes, (ii) it promotes creativity, (iii) it allows individuals to focus on essential things, (iv) it improves attention, (v) it enhances problem-solving capacity, and (vi) it reduces stress and anxiety. Despite several advantages of online learning, there are many challenges, too. Several distractions affect the focused attention of learners: mind-wandering, multi-tasking, using digital devices, consistent interference, and unexpected interruption. In addition, there are greater possibilities for learners to function in an autopilot mode as it is more tedious to consciously live every moment, focusing on each instant, staying wholly aware and engaged.

Substantial literature underscores the significance of mindfulness in digital learning. Several studies have examined the mental states in which humans function and their connection with mindful learning. However, there needs to be more exclusive identification and elaboration on the factors that affect mindfulness in the digital learning environment. Therefore, this study aims to find out the components that affect students' focused attention in digital learning. Thus, it seeks to contribute to improving scientific research on the mindfulness of digital-age learners through a brief literature review. The outcomes of this research are intended to provide insightful information to learners, educators, course providers, and organisations about the components they need to focus on for successful digital learning. In addition, the study also includes strategies for elevating the mindfulness of students enrolled in online learning.

LITERATURE REVIEW PROCEDURE

Many studies have researched mindfulness and digital learning individually. Some studies have made detailed research on different dimensions of mindfulness and their impact on learning separately. However, the literature accumulating different factors that impact mindfulness in a digital learning environment must be

more extensive. Hence, the paper intends to bridge this gap by delivering a detailed evaluation of the synergies between mindfulness and digital learning through the factors that impact the process.

REVIEW OF RELATED LITERATURE

Digital learning

Digital learning refers to any instructional practice that effectively uses technologies to strengthen pupils' learning experience, incorporating a extensive range of digital tools and practices. Digital learning environments are the first to practise programmed computer-supported learning, which is beneficial to cater to the demands of remote learners, providing them with a variety of courses and highly qualified instructors who cannot be accessed directly. However, the latest advancements in the field embrace highly sophisticated schemes to make learning more enjoyable. Furthermore, Researcher in [2] proposed three essential aspects of successful mobile learning: Device aspects that denote the functional, physical and technical characteristics of the device as it serves as the interface between the learning tasks and the learner; learner aspects include human learning capacities; and social elements that refer to the extent to which the learners abide by the rules of cooperation to interact with each other.

The Concept of Mindfulness

Mindfulness connotes "actively noticing new things" and "it's the essence of engagement" [7]. Mindfulness makes a person less judgemental, boosts performance, unlocks creativity, and reduces stress. By being more attentive to what is happening around us, people can recognise opportunities, take advantage of them, and avert risks. Authors in [5] denoted that mindfulness ability (MA) is the primary element fostering successful learner navigation. Besides, it boosts academic performance, self-efficacy, self-leadership, cognitive functioning, emotional regulation, emotional intelligence, motivation, memory, and all basics towards learning and achievement. Mindfulness improves the general well-being of individuals, as the term translates to "something remembered" [8]. Two main elements of mindfulness include non-judgemental awareness and self-regulation of attention. Being non-judgemental promotes emotional regulation since non-judgemental

awareness enhances traits like openness, curiosity and recognising these experiences, lowering reactivity. Self-regulation of attention is developed by sharpening awareness of an individual's present experiences regarding physical sensations, feelings, and ideas. Therefore, it is an essential habit that must be cultivated throughout everyone's life.

The need for mindfulness in digital learning

A study by [5] revealed that mindfulness is highly compatible with the digital learning scenario. Since online learners actively seek content aligned with their objectives, these require sustained attention to study tasks that involve cognitive control correlating with current information processing. When people are mindful implicitly or explicitly, (i) they can view the scenario from multiple perspectives, (ii) view the information presented in the situation as new, (iii) pay attention to the context, and (iv) can categorise into new groups through which the information could be interpreted. Investigators in [9] witnessed mindful learning as a crucial element to achieving mastery experience in creative game-based learning. In this regard, a study conducted by [8] to determine the mediating role of mindfulness among L2 learners' burnout and engagement levels proposed mindfulness as a coping mechanism for reducing burnout and enhancing student engagement. Besides, mindfulness techniques can be linked to elevated memory capacity and higher learning outcomes. Therefore, 'mindfulness' becomes the focal point for successful digital learning. Hence, it is necessary to explore various aspects that affect mindfulness.

Factors impacting mindfulness in digital learning

The factors affecting the mindful e-learning process can be grouped into various categories.

Personal factors: Online learners study remotely through digital learning platforms and do not have adequate interpersonal communication, which might create mental tension as they spend most of their time isolated. The main problems encountered by these students include depression, anxiety, social media fatigue, and mild to severe stress. Thus, mental health is critical to mindful learning in a digital setting. Mindful learners show greater study engagement. However, intrinsic

motivation and psychological capital significantly mediate the relationship between student engagement and self-rated mindfulness [10]. Hence, intrinsic motivation and psychological capital are yet another two impacting factors.

Moreover, self-regulation can significantly predict the success of online learning. Self-regulatory learning (SRL) skills are an extraordinary umbrella that includes behavioural, emotional/affective, cognitive, meta-cognitive, and motivational aspects of education [1]. Self-efficacy, a self-regulatory attribute, is a highly impacting factor connecting mindful learning and mastery experience. Students who believe more in their skills and knowledge are highly motivated to persevere and invest in complex tasks, contributing to successful learning. Since verbal ability and self-regulatory skills, particularly self-efficacy, promote the voluntary involvement of learners, these are also identified as significant features fostering mindfulness.

Technological factors: In self-paced learning, the interface design is critical to simplify the navigation of information systems. Researchers in [11] propounded that the perceived user interface design (PUID) is the determining factor of continued usage intention by the interface (CUI). In this regard, user satisfaction and perceived usefulness of the design predicted CUI. Therefore, if the user perceives the interface design to be less attractive, they will not have an intention to continue learning, which indeed interferes with mindfulness in the digital learning set-up.

The availability and accessibility of resources also correspond to higher attrition rates in online learning [12]. For instance, device failures, connectivity issues due to slow internet, software glitches, etc., cause motivational constraints to the learners, affecting their mindfulness. The quality of technical support systems is crucial in digital learning.

Instructional design is an important feature that grabs learners' focus and attention. Effective use of multimedia elements like audio, video, pictures, and text is pivotal in digital learning. Since multimedia elements can determine the ease of focus for a digital learner, these are considered necessary. Also, frequent alerts and notifications interrupt the learners, affecting their learning effectiveness.

Pedagogical factors: While a student engages in four modes: interactive, constructive, active, and passive (ICAP), interactive teaching methods are highly sought as they involve both facilitator and learner in constructive activities, and each of them takes their own turns for a sufficient time [13]. Hence, interactive teaching techniques increase mindfulness by enhancing student engagement. Including variety in instruction would hold the student's attention from the beginning to the end. Therefore, course design/ a well-crafted curriculum is an important feature that attracts the attention of digital learners.

Moreover, an acceptable workload promotes student engagement, inspiring them to work hard towards producing high-quality outcomes [14]. When students can control their learning, they become more self-regulated learners. Reflective and formative assessments and their corresponding feedback must be organised to promote this development. Hence, assessment and feedback are identified as essential components impacting learners' attention. The constructive nature of both fosters self-regulation in learners.

Environmental factors: A teaching and learning environment without excessive workload encourages learners to perform high-quality work [14]. An environment conducive to online learning is a must for the learners to stay mindful. For instance, an environment far from distractions complements mindfulness and digital learning effectiveness. Furthermore, supportive peers and family members are crucial in motivating online learners and strengthening student learning ability. Therefore, the teaching and learning environment, as well as a robust support system, impact learning.

Strategies to improve mindfulness in digital learning

Mindfulness training must be incorporated into the digital learning curriculum to enable digital learners to stay focused and present. Researchers in [15] reported that mindfulness practices in a study program transformed the online learning experience and impacted learners' personal lives. The study also found that mindfulness exercises enhanced self-regulated learning skills, the most essential skills for online learners. Moreover, the findings also underscore the possibility of nurturing self-awareness, enhancing intrinsic motivation, and

inculcating a mindful attitude to time management.

Creative game-based learning can be employed to enhance mindful learning. This attracts learners' attention and elevates repeating skills or targeted behaviour. In this aspect, users' experience can be influenced by self-determination and the need of an achievement goal [9]. Furthermore, designers must focus on developing an attractive user interface that attracts users' intention to use the platform continuously. In addition, providing personalised support and adaptive features in computer-assisted learning systems has greater scope in facilitating more accessible learning through reduced efforts or increased performance. Moreover, structured breaks must be incorporated to reduce cognitive fatigue.

Apart from this, mentoring and coaching for teachers must be given to change their teaching practices, facilitating strong pedagogy. Faculty training in online course design must be enhanced as it directly relates to overall student retention [12]. Particularly for staff members who are directly handling classes from face-to-face instruction to an online environment, proper training must be given, enabling them to prepare for a smoother transition. Besides, a well-designed curriculum with an acceptable workload must be designed [14]. The programme must be coherent, and class coherence could be developed through assignments, projects, and group discussions; teaching should be focused on imparting key concepts and encouraging understanding, establishing a warm relationship between instructors and students; practical assessments can be given, and teaching must provide opportunities for active engagement of learners.

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Digital Intelligence for Sustainable Business and Economic Diversification

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ABSTRACT

Digital Intelligence means understanding customer demands and how users connect with and react to mobile sites, applications, and websites and, how they use data to optimise their experience in terms of where, when, and how they interact. A more varied economy and more sustainable enterprise are made feasible by digital intelligence. It heavily relies on artificial technologies, applied research, data analysis, and a commitment to environmental and social responsibility to operate into new concepts or approaches, power, and growth. The study's primary objective is to ascertain how digital intelligence has supported positive economic growth and development by minimizing environmental effects, optimizing operational efficiency, and assisting in the economy's diversification away from a single source of income and toward several sources. This article explores the use of digital intelligence to support sustainable business practices and economic diversification through the utilization of secondary data sources.

KEYWORDS: *Sustainable business, Digital intelligence, Artificial intelligence, Sustainable development goal, Economic diversification.*

INTRODUCTION

The 21st-century world we live in today is not the same as the previous century, and the world of tomorrow might not look the same as the world of today. In today's technologically advanced world, digital intelligence is the combination of social, emotional, and cognitive skills that help people overcome obstacles and adjust to their surroundings. In today's world, humans must interact with this advanced technology. It implies that for humans to have a certain level of digital intelligence, they must employ this intelligence. Digital Intelligence enables more diverse economies and more sustainable business practices. It significantly uses artificial technologies, applied science, and data analysis with a dedication to environmental and social responsibility to operate into new ideas, methods, power, and growth. It is essential to a sustainable business because it helps to minimize negative environmental effects while optimizing operational effectiveness. It not only helps to preserve the environment but also increases energy efficiency. Digital Intelligence is utilised in everyday

life, for instance in cars, DI is used for safety functions such as voice recognition technology that controls various functions of the car, such as navigation and, music without taking their hands off the steering wheel for the convenience of the driver and reduce distraction for safety road drive, it is used to control traffic in smart cities to enhance and lessen traffic jams etc.

Economic diversification is the process of broadening the range of goods, markets, and services from a single source of income to several sources to promote positive economic growth and development. For example, the Garo Hills region in Meghalaya, India, has investigated the marketing of high-value crops such as pineapple, areca nut, and cashew nut to promote regional growth and prosperity [1]. This economic diversification has been made easier by digital intelligence to lessen dependence on conventional industries and encourage the expansion of new industries. With the use of digital intelligence, the nation can diversify its economic outputs, boost its competitiveness internationally, and generate employment opportunities.

LITERATURE REVIEW

“Sustainable Business Practices and the Role of Digital Technologies: A Cross-Regional Analysis” investigated the connection between sustainable business practices and digital transformation. It examines how digital intelligence can help or hinder a company’s long-term growth. Additionally, the study looks into how geographic locations, national levels, income levels, and demographic factors affect a business’s ability to survive. The study also shows that entrepreneurs are much more likely to incorporate social and environmental factors into their decision-making when they strategically use digital technologies in their sales processes.[2]

“Strategic Integration of Artificial Intelligence for Sustainable Business: Implication for Data Management and Human User Engagement in the Digital Era” explores how for-profit companies’ sustainability initiatives are strengthened by the strategic integration of artificial intelligence concepts. The two most significant topics it covers are the effects of integrating AI in two crucial areas: data management in businesses and the expansion of human interaction in the digital ecosystem.[3]

“The New Digital Economy and Sustainability: Challenges and Opportunities seeks to examine the relationship between sustainability and the idea of the digital economy. Within the framework of sustainability, the study sheds light on the potential and difficulties presented by the digital economy. It encourages business professionals to apply cutting-edge technology to sustainable development.[4]

“Digital Sustainable Business Models: Using Digital Technology to Integrate Ecologically Sustainability into the Core of Business Models” examines the use of digital technologies by startups to develop business models that are both economically and ecologically sustainable. It illuminates novel strategies by merging research on ecological sustainability and digital business models.[5]

OBJECTIVES OF THE STUDY

The study primarily focuses on the following objectives:

I. To study how digital intelligence supports eco-

friendly business methods across different sectors.

II. To analyse how digital intelligence contributes to economic diversification in developing nations.

METHODOLOGY

The research was carried out through a comparative analysis of various academic articles that have already been published and conference papers. The keywords “digital intelligence”, “sustainable business”, and “economic diversification” were used to collect and analyse data. Peer review status, publication within the last decades, and relevance to the research topic were some of the selection criteria applied to the study. The data gathered from various sources is thematically analysed to spot patterns, trends, and research gaps.

DIGITAL INTELLIGENCE AS ENVIRONMENTALLY SUSTAINABLE BUSINESS ACROSS VARIOUS INDUSTRIES

In many industries, digital intelligence is crucial for encouraging ecology-spot-friendly practices. By utilising digital tools and technologies, businesses can improve their operations, lessen their environmental effect, and achieve overall sustainable performance. Companies can gain valuable insights into their operations and identify improvement and waste reduction areas by collecting and analysing data from various sources. Businesses can also optimize their supply chain management procedures with the help of Digital Intelligence. Businesses can track or trace their products throughout the supply chain by using cutting-edge tools like Blockchain and Internet of Things (IoT) devices, assuring accountability and transparency. If the consumer wishes to verify, for instance, where the item has arrived, its destination, or whether the product has been shipped from the company they ordered, they can follow the item along the supply chain and verify. By using this method, businesses can lower their risk of fraud and counterfeiting and make more informed decisions about sourcing and production, which will ultimately result in more sustainable business practices. Businesses can communicate their sustainability efforts and initiatives to a wider audience by utilising social media, online platforms and other digital channels. Developing customer trust and loyalty can lead to

increased sales and brand reputation, which improves business outcomes.

HOW DIGITAL INTELLIGENCE AIDS ECONOMIC DIVERSIFICATION IN DEVELOPING COUNTRIES

In today's growing digital world, having strong digital intelligence is important for individuals and economies. With the rise of E-commerce platforms and digital marketplaces, developing countries can diversify their economies by directing resources to new markets and opportunities. This allows businesses to diversify their customer base and generate new revenue streams, reducing their reliance on a single market or industry. Digital intelligence can empower individuals to become entrepreneurs and create their own opportunities. This can help to lower unemployment rates and create a more diverse and dynamic economy. For example, an individual with access to online resources and tools can start their own business online business in this world. This contributes to a shift away from reliance on traditional industries and toward knowledge-based and technology-driven sectors. Countries with higher digital intelligence levels have more diversified economies and faster rates of economic growth according to the World Bank Report.[6]

ADVANTAGES AND DISADVANTAGES OF DIGITAL INTELLIGENCE

Advantages

1. It can access and process a massive amount of information quickly and efficiently.
2. The ability to connect and work together on projects, regardless of their physical location with others through email, video conferencing and social media platforms, which increases productivity and innovation.

Disadvantages

1. Due to the deluge of information available online, people struggle to sort through it all and find the important information. This can cause decision paralysis and lower productivity because people may spend too much time looking through it all without really getting anything done.

2. One major concern with digital intelligence is the potential for risk and privacy since most people store and transmit sensitive data using digital technologies, which makes them extremely vulnerable to cyberattacks that could lead to serious consequences.

CONCLUSION AND DISCUSSION

Digital intelligence plays an important role in contributing to sustainable business practices by allowing businesses to optimise their operations, improve supply chain management and engage with customers in more meaningful ways.

Businesses can enter new markets and diversify their revenue sources with the help of digital intelligence. Businesses can discover new trends, customer preferences and market opportunities by leveraging the power of data and analytics, which enable them to innovate and adapt in a business environment that is changing quickly. Digital intelligence can help to create a more diverse and resilient economy by opening up new markets, empowering individuals to become entrepreneurs and driving innovation in traditional industries.

Digital intelligence offers numerous advantages in terms of accessing information, communicating and collaborating with others on projects. However, there are some drawbacks as well, like risk to privacy and information overload. People can maximise the benefits of digital technologies while minimising the drawbacks by developing a high level of digital intelligence and staying up to date on best practices in digital security.

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Artificial Intelligence and Financial Decision-Making: A New Era of Data-Driven Insights

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ABSTRACT

Making decisions is a complex activity, especially regarding financial decisions. Financial decisions have a vital role in financial well-being. Recent technological advancements have significantly influenced everyone in every part of life. Artificial intelligence is one of the inventions that can transform how we do things. It is being used in many industries, such as health and finance. The financial sector rapidly adopts artificial intelligence (AI) to enhance decision-making processes. AI delivers several opportunities to boost financial decision-making by integrating large volumes of data and sophisticated algorithms. The concept of artificial intelligence and its transformative impact on various financial domains, including algorithmic trading, risk assessment, investment management, and fraud detection, are examined in this work. By analyzing vast datasets and identifying complicated patterns, AI empowers professionals to make informed and data-driven decisions, potentially leading to improved financial performance and risk mitigation. The study uses data from various published sources, such as national and international journals, magazines, and websites. However, the paper acknowledges various AI implementation opportunities and challenges, like potential biases, transparency concerns, and regulatory uncertainties. The conclusion emphasizes the need for responsible development and implementation in finance, prioritizing ethical considerations and human monitoring.

KEYWORDS: *Artificial Intelligence, Financial decision-making, Algorithmic trading, Risk assessment, Ethical considerations.*

INTRODUCTION

Traditional computer-based simulations of human intellect, such as man-machine games, machine identification, and natural language processing, are being supplanted by artificial intelligence (AI), the fundamental technology propelling a new industrial as well as technological advancement.

Dr Paul Marsden, “Artificial Intelligence is a technology that behaves intelligently using skills associated with human intelligence, including the ability to perceive, learn, reason and act autonomously” [1].

As per Dimitar Dobrev, “AI will be such a program which is an arbitrary world will cope not worse than a human” [2].

Building robots or systems that can do tasks that typically require human intelligence is the subject of the computer science discipline known as artificial intelligence (AI). Learning, reasoning, problem-solving, understanding spoken language, sensing, and interacting with one’s environment are some of these responsibilities. Artificial intelligence (AI) is classified into two types: wide AI, which aims to complete any intellectual task that a human can perform, and narrow AI, which is designed for a particular purpose (such as facial recognition or language translation).

Artificial Intelligence (AI) comprises several subfields, such as natural language processing, robotics, machine learning, as well as neural networks. Artificial intelligence (AI) has evolved as a transformative

landscape in various sectors, and the financial industry is no exception. Human skills, historical data analysis, and intuition have traditionally been used in economic decision-making. However, new strategies are required due to the amount of data and the ever-increasing complexity of financial markets. Thus, the field of financial decision-making is changing due to the vital instrument known as artificial intelligence (AI).

Artificial Intelligence (AI) is transforming the finance industry in a number of ways, including improved efficiency, security, and decision-making processes. Human expertise, historical data analysis, and intuition have long been the foundation for financial decision-making. However, the growing complexity of financial markets and the amount of data need novel ways. Artificial intelligence (AI) has evolved as a formidable instrument, changing the landscape of economic decision-making by offering:

Enhanced Data Processing: AI systems can examine massive datasets, such as financial statements, market trends, and news sentiment, at unprecedented rates, detecting tiny patterns humans may miss [3].

Predictive Analytics: AI algorithms can be prepared to forecast future changes in market, creditworthiness, and potential dangers, enabling preemptive strategies and educated investment decisions [3].

Automated operations: Artificial intelligence (AI) can automate repetitive operations like fraud detection and trade execution, allowing human resources to perform more strategic endeavors [3].

EVOLUTION OF THE TERM

John Mc Carthy initially called the phrase “artificial intelligence” in 1956 during a conference at Dartmouth college to refer to “thinking machines”. This conference has been marked as the birth of Artificial Intelligence as a field of research aiming to create robots capable of carrying out activities requiring human intelligence. However, until 2000, insufficient computer power and storage capacity prevented the field from progressing. As a result, governments and investors lost interest, and economic backing and funds for AI declined between

1974 and 1980 and 1987 and 1993. These financial limitations are sometimes referred to as “AI winters”.

LITERATURE REVIEW

Researchers in [4] explored the moral ramifications of AI integration into decision making regarding finances, aiming to bridge the gap between AI technology and the systems controlling its use.

The study in [5] explored the effect of artificial intelligence on Jordanian pharmaceutical businesses, highlighting its capability to transform the industry.

Researchers in [6] explored AI’s potential in finance, highlighting its ability to automate trading, increased predictive analysis, and reduce costs, but emphasizes the need for careful ethical and legal considerations.

Researchers in [7] provided a comprehensive overview of artificial intelligence knowledge, identifying areas requiring further attention through bibliometric analysis and content analysis, and recommended further research in finance technology.

The study in [8] emphasized the need for an ethical framework to ensure fair development of AI systems in the financial sector. It highlighted the intricate connection among AI innovations and moral standards, suggesting stakeholder participation, regular audits, governance structures, and explicit rules. This resource aids in informed debates and decision-making.

The study in [9] intended to gain an understanding of the challenges & opportunities linked with implementing Artificial Intelligence in the financial management process and to evaluate AI solutions for the efficient functioning of economic management. This study was based on a secondary source of data.

The study in [10] explored Explainable Artificial Intelligence (XAI) techniques in finance, focusing on their potential to reduce accountability issues and increase transparency in financial decision-making. It highlighted the complexity of advanced sophisticated machine learning models and the importance of using models like decision trees, rule-based systems, and linear regression for accurate forecasts.

The study in [11] explained artificial intelligence as an innovation in technology involving machine learning and algorithm language. The study discussed its popularity in many sectors, such as automobile, healthcare, robotics, finance, etc. The applications and challenges associated with implementing artificial intelligence were also discussed.

Researchers in [12] explored the effect of artificial intelligence on financial judgement, highlighting its significant transformation in operations, personalized recommendations, and improved customer experience. It also discusses challenges and ethical considerations for AI's responsible development.

The study in [13] examined the concept of artificial intelligence and the adoption of financial algorithm advisors. These findings expanded the research on the significance of XAI for adoption of algorithms as well as trust. The work revealed the overall adoption rate of different experimental conditions. According to the study's findings, machine learning has gained popularity over the past ten years and has ramifications for numerous facets of daily life. Finding the most effective means of communicating and presenting AI-based judgments to people was one of the study's aims on the subject of explainable AI, to foster the necessary cooperation between humans and machines.

The study in [14] explored the term artificial intelligence as well as its implementation in finance landscape and identified possibilities as well as challenges linked with integrating artificial intelligence in finance.

Researcher in [15] concluded that a review of the available research on artificial intelligence's impact on accounting and finance suggests it will become crucial in the future, as it improves accounting performance.

OBJECTIVES

1. To explore the subject of artificial intelligence.
2. To investigate the efficiency of artificial intelligence in financial decision-making.
3. To identify the opportunities for the implementation of artificial intelligence in finance.
4. To explore the challenges associated with implementing artificial intelligence in financial decision-making.
5. To examine the ethical considerations in applying artificial intelligence in finance.

RESEARCH METHODOLOGY

The study relies on secondary data collected from various financial websites, books, articles, research papers, national and international magazines, and journals that address different facets of artificial intelligence.

APPLICATIONS

Fraud Detection and Prevention

Artificial intelligence algorithms can analyse enormous transaction volumes in real-time to detect odd patterns that indicate fraud. Machine learning models employ prior data to identify potential dangers and abnormalities, increasing fraud detection accuracy.

Algorithm Trading

AI powered trading platforms use sophisticated algorithms to examine market data as well as place deals during optimal periods. Large volumes of data can be processed by these algorithms far more quickly than by human traders, allowing them to see trends and make snap judgments that optimize earnings.

Customer service and chatbots

Chatbots along with virtual assistants powered by artificial intelligence (AI) give clients round-the-clock assistance by managing questions, completing transactions, and delivering tailored financial guidance. This lessens the workload for human representatives while improving the customer experience.

Challenges and Considerations in Financial Decision-Making Process:

Data Privacy and Security

Financial artificial models require a large amount of high-quality data to function properly. Poor quality of data, data with biases, or incomplete databases can

lead to inaccurate forecasting. Even though massive volumes of data are necessary for artificial intelligence algorithms to operate efficiently, maintaining security and privacy is crucial. Financial institutions must provide or develop strong security measures to protect this data and maintain trust in the system. [6].

Regulatory and Compliance

The financial sector heavily regulates artificial intelligence systems, including GDPR, which presents challenges due to technology's opacity, complexity, and biases. Collaboration strategies between regulatory agencies and financial firms are crucial for effective regulation and ethical standards [6].

Biasness

Artificial intelligence in financial decision-making requires fairness and thorough algorithm testing to minimize potential ethical ramifications, especially in the face of biased data sets [8].

Transparency and Accountability

The intricacy of regulating and complying with AI systems involves the explainability and opacity of these models, which may be devoid of accountability and transparency.

Decision-making processes are opaque, which raises questions about explainability and accountability. Decision-making and model development procedures must be transparent. [8].

Economic and social impact

Artificial intelligence's integration into finance could significantly impact jobs and the labour market, necessitating skill acquisition and potential employee displacement. AI could streamline manual operations, boost productivity, and reduce demand for repetitive tasks, necessitating strategic planning [8].

DISCUSSION AND CONCLUSION

Artificial Intelligence (AI) offers numerous benefits to the financial sector, including increased efficiency, market prediction, risk assessment, and portfolio management. However, challenges like transparency and accountability need to be addressed. To

effectively integrate AI into financial decision-making, stakeholders must work together, eliminate biases, ensure transparency, and implement necessary rules. A comprehensive framework is suggested to achieve maximum benefits with minimal losses.

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Tourism, Hospitality, opportunities for Alternative Accommodation in Chettinad, the Creation of Service Quality Options

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ABSTRACT

Tourist Destinations wherever they are needed to focus on the way Service Quality (SERVICE QUALITY) has to be addressed. The Research paper is an effort to engage the tourism ecosystem in Chettinad area and Karaikudi much better. A total of twenty-five functioning Mansions in the area were identified to ensure objectivity in understanding the Service Quality implementation in the Mansions. Chettinad area provides a wide variety of Hospitality opportunities and supports Tourism, which over a period will become a successful vehicle for the Tourism ecosystem to cherish and ensure factors of success to the Mansions, the people and the community that lives around the place to ek out employment and livelihood options through the options of tourism and hospitality that the region provides.

KEYWORDS: *Hospitality, Alternative accommodation, Service quality, Chettinad.*

INTRODUCTION

Chettinad originally had ninety-six towns that were closely related to the respective temple clans and groups. Over a period of time the villages have shrunk, with only 75 of them in existence which are home to a variety of temples built by the Pandyas and Cholas. Nine among these temples serve as the essence of the Chettiyar community and their administration which has played an important role in fostering communities, and even shaping the fabric of society. Truly one can catch a glimpse of what Chettinad was through 11,000 abandoned mansions, that stand in full glory that stand the test of time. The mansions as well as the ancient temples have intricate carvings that dot the region, stand a testimony to the affluence of the Chettiar community [1].

STATEMENT OF THE PROBLEM

The primary reason for selecting the research topic was to ensure a juxtapositioning of the SERVICE QUALITY on the nascent Hotel/Hospitality business in the Chettinad area. Though Chettinad/Karaikudi is becoming a place for tourism; a lot needs to be done

from the accommodation facet. If the tourism system in the Karaikudi area would help assuaging the dynamics of Hospitality, the need for hotels of quality will surely come up. The guests of today, whether, domestic or overseas, want to receive comfort with the finer aspects of quality.

PURPOSE OF THE STUDY

The mansions in the area have become unique and important. However, from about 11,000 (some even say, 15,000) mansions that existed at the height of glory, today about two dozen are functioning as Heritage properties. The primary question the researcher had in mind was to address the SERVICE QUALITY issues, and how the Owners/Managers faced it with the visitors who were coming to the area. The researcher being a hospitality professional, felt the need for a micro-assessment of a destination like Chettinad. By using the SERVICE QUALITY framework, one would be able to gauge the requirement of the mansions and how they would be able to support the Hospitality environment in the destination. One can surely say that a study of this nature will help in getting baseline data, which will further help research and provide a way forward.

CHETTINAD, THE HISTORY

Historically, Chettinad finds a mention as, the Nattukotai, the country fort or the Nagarthar which is the urban-city dwelling of the Chettiars. The Chettiars belong to a hereditary trading caste originally hailing from the eastern port city of Kaveripoompatinam/Poompuhar Tamil Nadu, where they traded in salt under the Chola dynasty. The question arises, whether, natural calamities or economic issues, they faced that were the reason for their 13th century migration inland to the 96 villages that then comprised Chettinad [2].

If one account mentions persecution by the Chola dynasty, another suggests they were lured by the Pandya rulers, while yet another attributes the relocation to a tsunami that destroyed Kaveripoompatinam. One facet is clear, the migration of these merchants, ensured the establishment of a new location that evolved over a period; what is Chettinad today, creating a tourism product that one can market using the three A's framework of tourism, Accommodation, Accessibility, and Attractions. Constructed between the mid nineteenth century to the twentieth, the Chettinad homes, some of which make the grand cottages of Newport and the villas of Cap Ferrat look puny, number over 15,000 throughout the area of Chettinad, which covers roughly 600 square miles. Many have specious interiors with over 60 rooms in the 1.5 acres of built area [3].

LOCATION AND ITS ADVANTAGES

Chettinad, by itself is an area, but the landmark town is Karaikudi, which is part of Sivaganga District. Karaikudi, located at 418 and 411 kilometers, from Chennai and Bangalore respectively, Karaikudi is near Madurai (90 km), Thanjavur (90 km), Tiruchirapalli (Trichy) (90 km), Rameswaram (130 km), which means, the destination will encourage a spill-over of visitors, if the tourism system is able to establish a connect, whether it is the domestic or inbound.

CHETTINAD, THE UNIQUE MANSIONS

What is it that makes Chettinad unique to Tourism and Hospitality, one that needs to understand and estimate. A work very eloquently speaks of the gigantic, glamorous, mansions, houses built by the rich merchant families of the Chettiar community, who had amassed lot of wealth

as they traded with Southeast Asia. The nineteenth and twentieth centuries made them an economic power which ensured they were able to build these structures, which today attract not only the Indian visitors, but also overseas. In fact, Chettinad and the mansions have become an enigma to the visitors who appreciate the art, architecture, the culture, and the heritage that has been establish over a few decades [4].

Chettinad Mansions, the decline, the opportunity

Senthil a manager with a Mansion in the Chettinad area mentions a fact, that it was the second world war (1939-1945) and its starting that created a void for the residents of the mansions, as the businesses came to a halt. In fact, the second world war turned out to be the darkest period of the life of the Chettinad [4]. World War II ensured the reign of the Chettiars came to an end [3]. The British too, wanted them to be cut from the financial system in Southeast Asia, and the Japanese threw the Chettiars out of Burma (now Myanmar) after they had invaded. With money flow decreasing, the economic system collapsing and most Chettiars left for Chennai, Mumbai, Singapore, and the United States, starting new businesses or entering the field of medicine and law. There were now about 120,000 members of the community in India and beyond. Senthil makes a sad reference to the fact that most of the mansions are in a dilapidated condition, a few have been converted into heritage hotels and even museums, by the owners, who want to keep the Chettiar legacy alive. It is here that one sees the opportunity for tourism to thrive. One can see that a total of about 30 mansions are functioning as accommodation facilities, which will be able to attract the visitors. With the Tamil Nadu, Department of Tourism and the other stakeholders making efforts to promote tourism in the Chettinad area, one can see that the mansions become tourism products, in the heritage category. In a way it can be said that, tourism has provided for a resurrection of the mansions, which will not only support those who own them, but also to the local community which can seek livelihood options through tourism. The tourism opportunity that one can see elaborated by the fact that few of those owners live in them now, but, like the many castles and manors of the English countryside, the residences are just a familial status symbols of opulence, besides, being

worrisomely expensive to manage, but all having an emotional attachment. There is no resale value, except if it is brought down and sold. Who will buy a one hundred fifty-year-old, 85 room villa with the nearest airport being two hours? But that is not the point, as any Chettiar will speak up completely annoyed [3]. The local tourism officer mentioned that, though the mansions are getting to a dilapidated condition as the days, and months pass, the opportunity that some of the owners have been provided through tourism is to engage and explore with the tourism system, that will help to bring in a business opportunity. These days, lot of social media personalities and influencers are coming to Chettinad area to capture the culture, heritage, of the destination. Which means, once people come to know about the mansions, there will surely be a churn of visitors who will come. The local tourism officer, who wanted to remain anonymous, mentions, the tourism product is excellent, but will the families who own the mansions, be able to provide for the services that any visitor will ask for? Will the quality of service become a hindrance to the otherwise good product that is in the offing? Questions, that will capture the imagination of any tourism academic, researchers, and practitioners.

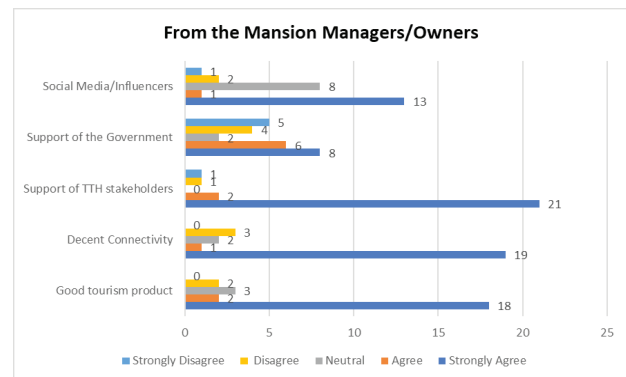
Chettinad mansions, as a Hospitality product

True the Chettinad mansions will attract visitors, if marketed well. But the issue to be addressed will be, how will the owners manage the properties from a concept of providing hospitality services? The visitors, if they are paying for the service offerings, will seek for a quality in the services. Shiva, a manager with Visalam, a CGH Earth run property (<https://www.cghearth.com/visalam>), mentions, that, “most of the owners are not able to operate the Mansions. Some like the Visalam owners have collaborated with professional organizations like, CGH Earth to engage in tourism and ensure a quality of service at the global level.” Shiva, however, laments, “Visalam is lucky to have the CGH Earth team, but many others are not able to do so. The Government, Central or State should encourage and provide for financial support through special purpose vehicles (SPV) to manage the mansions, thereby creating opportunities. But one aspect that will remain, is the quality of Service that the tourism products through the mansions will have to offer. The question

is, will the services be of global standards, or just wither away on account of bad practices.”

To establish a connect to the Hospitality business and Karaikudi, the researchers spoke with twenty-five of the active mansions in the area through the Managers and owners and were able to ascertain the following (illustration 1 and 1a). Though some of the Managers and Owners were initially reluctant to speak, after much discussion, they really opened in an informal way. The researcher is confident that with the passing of time, with the tourism system making efforts to collaborate with the all the stakeholders, there is surely going to be a change in the mindset.

Table 1. Inputs from the Mansion Managers/Owners



A total of five issues were asked to the twenty-five respondents (illustration 1) through a digital questionnaire, which had five choices of responses through the Likert Scale.

Karaikudi has a good tourism product

From the 25 respondents, 18 strongly agreed to the fact that, the tourism product was good, and worth marketing to the visitors. One of the respondents, who did not want her name to be revealed, mentioned that, “Karaikudi as a tourism product, will interest the inbound holiday makers, more than the domestic visitors, considering the fact that they will be able to appreciate the heritage and culture that Karaikudi possess.” Shiva, Manager at Visalam stated, “wherever, we get foreigners, they spend time to appreciate the heritage, culture, and the finer aspects of Karaikudi. The Indians visitors like to relax and wander around the places and tick them off, like a check-list. The foreigners however, as is the case, cherish, and one needs to be prepared with qualitative

information that is to be provided.” 2 respondents, disagreed to the fact that Karaikudi is a good tourism product. When the researcher probed further, it was clear, that they articulated the following:

- i. Need to promote the destination better in India,
- ii. Created reading material for people to understand the destination,
- iii. Social Media push.

It is therefore clear that Karaikudi if marketed well, will attract many domestic as well as global visitors, and one needs to do it in coordination, between the Hospitality Stakeholders, and Government machinery.

Decent Connectivity

19 respondents strongly agreed to the question of connectivity of Karaikudi, 2 remained neutral and 3 disagreed completely. True, Karaikudi, springs up as a surprise destination for those who know the place. As mentioned by Shiva of Visalam, “those who commute to Karaikudi by road, get the best of experience. Hence, I would consider the connectivity as decent.” Pradeep, a Tour Guide who moves around South India, mentioned, “if marketed well, Chettinad will be one of the tourism products in India. One really wonders, why the destination has been left by itself. The potential is enormous. Both the State and Central Tourism Departments should collaborate and ensure for Chettinad, with Karaikudi as the hub.”

Support of Stakeholders

With the support of the Hospitality industry, it is not possible to market any destination? Arumugam Gopal a Tourist Officer with the Ministry of Tourism, earlier based in Bangalore, now managing the office in Indore, states, “Karaikudi, is phenomenal place, like Agra has the Taj Mahal, Delhi has Qutab Minar, Thanjavur has the Brihadeshwara, Madurai has the Meenakshi Amman Kovil, Karaikudi is unique in a way from a destination perspective. It has the houses (the mansions) of the people who lived there and continue to do so. The place can only become successful, if all the stakeholders of Hospitality participate and ensure a success for one and all. It is a collaborative effort. Each of us must play a role. The Ministry of Tourism will be able to help in publicizing the destination and even getting the Heritage

property status for the Mansions who will apply for Heritage classification, it is the tour operators, the travel agents, who will have to market the destination and ensure the flow of visitors. By organizing roadshows, B2B (Business to Business) connect programmes, the destination can be encouraged a place of visitation.” 21 of the respondents strongly agreed to the fact that, all the stakeholders need to play a dynamic role to ensure success for Karaikudi as a destination over a period. The factors of success are slowly but steadily accruing, one needs to bid the time to ensure larger success, lamented a Tour Operator, who did not want to be identified in the research.

Support the Government

SP Singh a retired senior officer (DDG) of the Ministry of Tourism mentioned, “the Government Central or State will always support a good cause. It is how we sustain the product. One needs to realize that, tourism products have existed, in the case of Karaikudi is manmade and by the Standards of UNESCO, one needs to understand the Outstanding Universal Value (OUV), which will help Karaikudi as a destination to scale up.” Singh further adds, “the Government along with the hospitality Stakeholders will have to function in tandem to ensure success for the destination. Together, with writers and social media influencers, the outreach can be continued which will enable the factors of success for an off-beat destination like Karaikudi.” A total of eight respondents ‘strongly agreed,’ and six ‘agreed’ to the proposition, whilst a total of nine respondents ‘disagreed.’ The researcher connected with two of the respondents who disagreed, and one them agreed to speak up with him being referred by name and stated, “at times, it is the Government apathy that created obstacles for a destination. Knowledge of the destination, and how to promote the same will surely augur well for Karaikudi.”

Social Media/Influencers

A total of 13 respondents ‘strongly agreed,’ whilst 8 remained ‘neutral,’ to the cause of social media and the impact of the Influencers. Shiva of Visalam who had hosted Veidehi Gite, stated, “to get the influencer to our doorstep, it took us almost four-months of planning and agreeing to the terms and conditions of the Influencer. Not all the Mansions owners and managers have the

bandwidth to do the same in Karaikudi. It will be better, if the Government pitches in and helps bring in Influencers, who will be hosted by the stakeholders, contributing to their stay.” The researcher tried to reach out to two Influencers of repute, who had come to Karaikudi, but both refused to get into a discussion, and only stated, “read and watch our contributions on social media, you will be able to get to know Karaikudi and the Influencers better.”

KARAIKUDI AND SERVICE QUALITY HOSPITALITY OFFERING

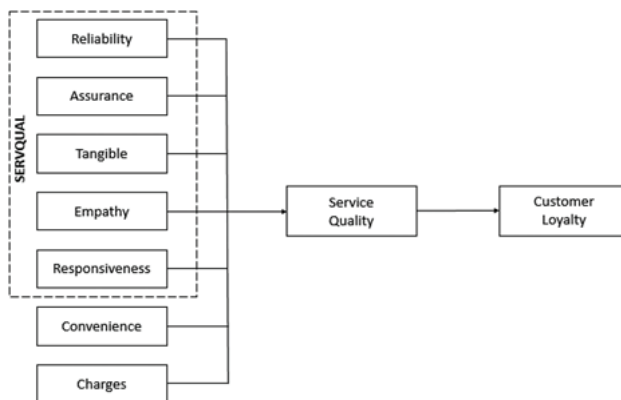
The researcher is of the firm belief that Karaikudi has the potential to become a global destination, and the outstanding universal value - OUV as defined by UNESCO, can be ascribed to Karaikudi. However, one question that plagued the researcher was, if the Owners/Managers of the Mansions offered their products for tourism, what about the Service Quality that will be offered, to the visitors, when they come to stay at the Mansions? What is the expectation of the visitors, be it Indian or overseas? Hospitality industry is a billion dollars industry, and a fast-growing business, which includes many activities, viz., hospitality businesses, tourism services, event management, and transportation. Service quality and customer satisfaction are the main stay of the industry. No hotel of any kind will be able to survive if they are not focussed towards consumers, to meet their needs, requirements, and expectations, so that the image of the hospitality business will be enhanced over a period. The hospitality industry in Chettinad faces unique difficulties than organizations like hotel chains, which offer services, on account of the dissimilarity in service. The probability of failing in the service sector is more than in the product segment on account of the tangibility. The quality of Service has always been revealed as a key factor in search for competitive advantage which can be sustained. Satisfying and retaining customers has been recognized as an important factor in hospitality industry. Fulfilling consumers' requests remains the greatest challenge in the service sector. In the hospitality industry, the consumer is not only the part of the actual consumption process, has preset service and quality perspectives which varies from person to person. The hospitality industry customer is increasing becoming more sophisticated,

and demanding. The mansions at Karaikudi and the service offerings is something that all in the business of travel and hospitality have questioned. The National Council for Hotel Management and Catering Technology functioning under the Ministry of Tourism, has aptly stated, “The purpose of hospitality is to enhance the lives of guests through quality service. Quality Guest Service is the consistent delivery of products and services which not only meets the expectations but also exceeds the expectations of guests. It focuses on providing delightful hotel experiences that may last a lifetime [6].” Cesar Ritz, had rightly pointed out, “no detail is too small, and no request is too big if it is meant to satisfying a customer [6].” NCHMCT has very adequately articulated the thought of providing Services to the guests, so to make the Hospitality service memorable and put forward the following facets to help the practitioner, academic, and researcher to understand the nuances.

1. A Guest Centric Focus,
2. Hotels focus on quality,
3. All employees focus on quality,
4. The role of the guest contact associates should be harmonized,
5. Service culture should be part of education and training systems,
6. ‘High touch,’ focus, instead of ‘high tech,’
7. Warm hospitality environment,
8. Excellence in guest relations,
9. Focus on SOPs,
10. All Departments should have quality as an inherent objective,
11. CQI should be mandatory to all,
12. Empower employees with responsibility for quality and are not just simply told what is expected of them,
13. Using teamwork/building and cross-functional groups for process planning,
14. Rewards to guest satisfaction linkage and
15. Thriving on change.

Guest loyalty is the primary goal of the hospitality and not only do we need to keep the guest happy, but also when they return. It is the moment of truth. Service is not only an attitude; it is a skill. The larger question, the research paper is trying to address, are the Mansions in Karaikudi able to address the issues of Service Quality of the services that they are providing to the guests who come to engage. Service quality is an important means of gaining a strategic advantage in an increasingly competitive business arena, where consumers demand higher quality while selecting service providers [6]. The parameters considered in the service quality models are used to measure the service quality in the services industry in multiple sectors, such as the healthcare/hospitals, the airlines, the education segment, the food and hospitality areas, the transport and logistics sector, government, and the public sector along with the banking (BFSI) [8]

Table 2. Service Quality Conceptual Model [8]



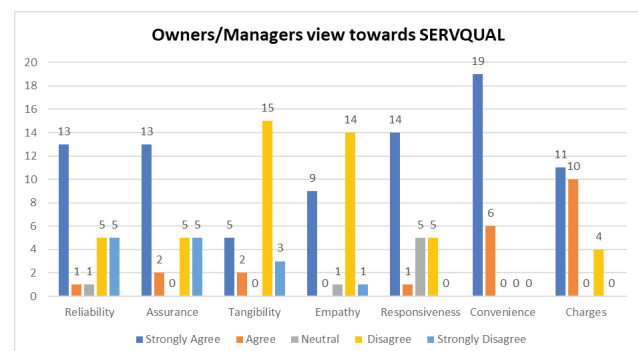
The facet of SERVICE QUALITY was put forward in a phenomenal research paper, that articulated the thought of providing qualitative services in the service business. To the five original constructs of i) Reliability, ii) Assurance, iii) Tangibility, iv) Empathy, and v) Responsiveness, to which were added vi) convenience and vii) charges, helps one to engage and ensure a better understanding of the nuances of service quality in a much stronger way [7].

The researcher wanted to ensure, if the Owners/Managers of the Mansions in understood the aspects of service quality which will keep them in good stead, to usher in quality in the tourism services that they will offer. Hence, the researcher connected with the twenty-

five Owners/Managers of the Mansions of Karaikudi, and questioned them with pointers from the service quality framework created by Parasuraman and team. The researcher asked the respondents to provide their views on the five Plus one service quality measures using a Likert Scale to get feedback about what they feel about the service offerings of the Mansions in Karaikudi. Illustrations (3 and 3a) provided for a bird's eye-view about the same, which helped the researcher to assess and help plan for the few of the Mansion Owners who had approached the researcher for advice. The focus was primarily on the following:

- Reliability on the Mansions as a Tourism Product offering services
- Assurance on the Quality of the Tourism Product through the Mansions
- Tangibility of the Mansion as a product for the visitors
- Empathy of the visitors towards the product of Karaikudi, the Mansions
- Responsiveness of the services being offered by the Owners/Managers of the Mansions
- Convenience of the Mansions from all aspects of Tourism i.e., Accessibility, Attraction and Accommodation
- The genuine features of the charges that are offered for the services at the Mansions

Table 3. Managers Owners/Manager Views towards the Facets of Service Quality



When the researcher received the inputs on each of the service quality parameters, it was an element of not surprise, but the reality of the work to be done in a tourism

destination like Karaikudi, which has the potential to attract not only domestic visitors but also global. It was in a sheer sense the belief in the OUV that one can get to learn from the UNESCO charter, which will help in imbibing the nuances for quality tourism promotion and help build in the community participation. It is a strong belief in the tourism ecosystem of Karaikudi, that, one needs to place a perspective on how the community will become part of the delivery of quality service through the mansions that have stood the test of times, though some have been brought down, some even sold for the wood that the mansions possess, and some even becoming dilapidated in front of our eyes.

Reliability of the Mansions as a Tourism Product offering services

In the reliability parameter of service quality, the researcher was surprised in a way at the truthfulness of the respondent, as 10 respondents completely 'disagreed,' and 'strongly disagreed,' with the reliability of the tourism product in Karaikudi, i.e., the mansions. This came as a surprise to the researcher. When the respondents were probed, further, it was Shiva of Visalam, who confirmed, that if the Mansions are being managed by professional, then the reliability of the service offerings will not be questioned. But a good number are being managed by family members who are not trained in the hospitality business, let alone services, and this is where, the issues of 'zero,' reliability surfaces." Though this is alarming, and one through the tourism system of Karaikudi needs to address the facets of reliability, 14 respondents agreed upon the facet of reliability of the tourism product, and these were mansions, which were managed well. The researcher got to meet with a visitor to a mansion; who without being identified in the research, stated, "I have lived in three mansions over two-years, and my experience has been very different in each. The professionally run, can understand the guests, and place the requirement upfront. It is the family run mansions that are in trouble, as they are not able to understand the quality of Services that are to be offered." This information in a way is a gamechanger and one needs to work on the same with the tourism system of Karaikudi and help in the building of a qualitative tourism product.

Tangibility of the Mansion as a product for the visitors

The 'touch and feel,' at the Mansion is something that the guests come to experience. Shiva of Visalam has been very candid about the same and mentions, "the visitors spend at least two to three hours, going in and around the Mansion, seeing the pictures, getting pictured with the old photographs, and even seeing the crockery, the furniture, the painting, and most important of all the tiles. So much so, a family, who had booked three rooms with us, ultimately made me take them to the local tile maker, for the requirements of tiles as they were building a house for themselves, and felt they need to incorporate these. These guests have already visited us four times over two-years." But the researcher got responses which were contrary to what Shiva of Visalam had to say, as 18 of the respondents 'disagreed,' to the fact that Tangibility of the mansions and its items to be displayed to the visitors played a role at all. The researcher was able to establish after not too open discussions, that the mansion owners are worried to showcase all the artefacts of the Mansions on account of free of theft and breakage. Well, this surely is a thought to augur with, but then one can easily mention that, if done in a proper way, the 7 respondents who agreed with the proposition of Tangibility, clearly have an opinion in the positive, which needs to be emulated.

Empathy of the visitors towards the product of Karaikudi, the Mansions

The facet of Empathy towards the tourism product came as a surprise. As nearly 15 respondents agreed and stated that to 'disagree,' on the fact that the finer aspect of empathy was lacking or was it just that they were understanding the concept of empathy as a service quality measure in a different manner. When the researcher spoke with those 9 who agreed, it was clear that, an openness for the visitors to engage better always helps in ushering in an empathy towards the tourism product.

Responsiveness of the services being offered by the Owners/Managers of the Mansions

The construct of responsiveness was a winner in a multitude of ways, as 15 agreed to the proposition, and 5 remained neutral and 5 chose to disagree. But then it

was clear that, those who disagreed, stated they were in the process of augmenting better service offerings for the visitors, be it Indian or the inbound foreigners based on the learning they have been having over a period and learning and unlearning from the other mansions who have been in existence for a while. The researcher now feels that, the functioning mansions need to come under one umbrella to share the best practices, which will help them to be in good stead. Having an informal association with or without the legalities will help nurture the cause of the mansions of Karaikudi. One suggestion that came from one of the respondents, was that, the Government Tourism Department or even the University (in this case the Alagappa University in Karaikudi) should take the lead to organize training programs for the Owners/Managers or at least the Managers and other employees of the mansions to help in augmenting quality human capital which will go a long way to engage better and ensure quality in the operations of the accommodation facilities.

Convenience of the Mansions form all aspects of Tourism i.e., Accessibility, Attraction, and Accommodation

One Indian visitor from Hyderabad, who had come to see the Meenakshi Amman Kovil, Madurai and the Perumal Kovil in Tiruchirapally stated eloquently, “the destination called Karaikudi is not a destination, but an open museum, where every inch of land is bestowed in history, culture, and heritage. It is a living place for people to cherish. The Government of India and the State of Tamil Nadu should apply to the UNESCO for heritage by ensuring the mansions get protected for the benefit of promoting tourism. And true to itself, Karaikudi as a destination and Chettinad as homeland is easily accessible to anyone who wants to enjoy history, culture, civilization, people, food, lifestyle, and heritage in one go.” This statement of a visitor, that was shared by one of the Managers, is very true to itself, as all the 25 respondents agreed to the construct of ‘convenience,’ at the Mansions from all aspects of the A’s of Tourism, i.e., which help in ensuring an outreach for the destination.

The genuine features of the charges that are offered for the services at the Mansions

In the construct of service quality, the facet of charges for the service offerings comes into question. And

21 respondents of the 25 agreed on the charges facet. Shiva of Visalam did mention that, “at times, some of the mansion’s charge excessively even though the people feel that it is not worth the monies that they spend. But then the online travel agencies (OTAs) like MakeMyTrip and Yatra, may not be aware about the service offerings which leads to this scenario of overcharging, and the guests only realize after they have reached the Mansion.”

CONCLUSION, THE WAY FORWARD

Karaikudi and the Chettinad is an enigma that one needs to assuage for the ‘now,’ and the ‘future,’ and ensure it grows into a tourist destination, with a meaning considering the Outstanding Universal Value (OUV) it possesses as per the UNESCO criterion. True the practitioners, the academics, the researchers, the Government, both at the State (Tamil Nadu) and Central level, will have to work together with the Mansion Owners and ensure for the region of Chettinad. The region, if targeted well will become a boon to the community, who will be able to derive employment through these Mansions and the business of Hospitality and ensure a boom period. The construct of service quality needs to be adhered to the best of the framework, which will further ensure quality in the guests who visit and the Mansions living up to the expectations of the visitors. A 360° approach wherein all the stakeholders get to play a role, will help in ensuring the cause of Karaikudi, Chettinad, the Mansions are well addressed.

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Warehousing 4.0 and Sustainability

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ABSTRACT

The advent of warehouse 4.0/smart warehousing has revolutionized the logistics and transportation industry in recent years, enabling organizations to improve their sustainability performance through the simultaneous monitoring of multiple factors such as energy output, performance, maintenance requirements, and other relevant metrics. This paper provides an overview of the Indian transportation and logistics industry and how the technological changes are influencing the industry and helping its digital transformation to achieve (environmental) sustainability improved by the research findings. The study findings lay the groundwork for empirical, descriptive, and normative research on the adoption and management of these (smart warehousing) systems within the transportation and storage industry. With the advent of Industry 4.0, warehouses have become a viable alternative to traditional warehouses as Warehouse 4.0. In this review, we will focus on the adoption and management of these (Warehouse 4.0/smart warehousing) systems within the industry.

KEYWORDS: Warehousing 4.0, Smart warehousing, Environment conservation, Impact of industry 4.0 on environment, Warehousing in future.

INTRODUCTION

Warehouses are designed for the specific needs of the supply chain, variety of products, kind of business, and type of industry. This involves many technical and economic factors which relate to capital investments as well as operation costs. Energy consumption is one of the major costs involved due to warehouse installations driven by energy devices, and material handling equipment, which uses either electric energy or gas or diesel, which are all having varying degrees of carbon footprint. Warehousing 4.0 has a positive impact on this adverse impact on the environment.

The concept of “Warehousing 4.0” in Industry 4.0

Traditional warehouses, also known as distribution centers (DCs), are undergoing significant changes due to two major trends. The first trend is driven by evolving customer expectations, order characteristics, and service requirements, leading to a shift in fulfillment and distribution methods. This transformation is giving rise to a new type of warehouse that is highly

adaptable, scalable, responsive, and maximizes the capabilities of both humans and machines through a mutually beneficial relationship. The second trend revolves around technological advancements in the physical and mechanical aspects of warehousing. The IOT, application of AR and VR, advanced sensors, collaborative robotics, and autonomous vehicles, are merging to create something entirely new: the intelligent warehouse.

What is Warehouse 4.0? (nexusintegra, n.d.)

To comprehend the concept of a 4.0 warehouse, it is essential to begin by examining Industry 4.0 as a foundation. This innovative approach is centered around the utilization of the Internet of Things (IoT), digital communication capabilities, and robotics. Through these interconnected systems, industries can enhance their operations with greater effectiveness and efficiency. (See Exhibit 1)

This modernized form of industrial warehousing has become an integral component of virtually every digitally-driven organization. As a result, smart

warehouses have evolved beyond the automated warehouses of the past decade. The functionalities of a 4.0 warehouse leverage cutting-edge technology to optimize various processes such as material handling, order fulfillment, and product storage.

The Evolution of Warehousing 4.0 (Tutam,2022)

Warehousing serves as a fundamental component of logistics, impacting a company's overall success. The growth of e-commerce has further highlighted the importance of warehouses within the logistics sector. Traditionally, warehouses are tasked with receiving, storing, maintaining, retrieving, and distributing variety of products hourly, daily, weekly. As a result, warehouse systems are in a state of continuous evolution to ensure the efficient movement of products throughout the logistics network. As a result, mobile, autonomous, compact, and collaborative systems are being progressively incorporated into warehouses, marking the advent of Warehousing 4.0. (See Exhibit 2 and Exhibit 3).

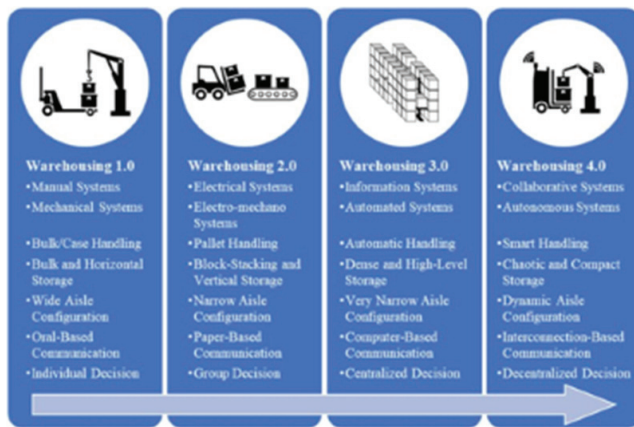


Exhibit 2: Evolution of Warehousing 4.0 (Tutam, 2022)

Four Levels of Warehouse Handling Systems



Exhibit 3: Levels of Warehouse Handling Systems (Tutam, 2022)

How does Warehouse 4.0 work? (nexusintegra, n.d.)

Within the context of Industry 4.0 and smart manufacturing facilities, these logistics centers utilize advanced technologies, like AI and ML. Their objective is to improve existing operational efficiency and to develop strategies that enhance future performance.

By streamlining processes and eliminating unnecessary steps, a 4.0 warehouse boosts productivity while safeguarding employees from monotonous, repetitive, and potentially hazardous tasks.

An intelligent warehouse incorporates crucial components for its establishment and functioning. They are sensors, energy-efficient installations, integrated management platforms, and real-time communication.

Some of the benefits of Warehouse Management 4.0

- Resource optimization is a key aspect of Logistics 4.0, which is an exceptional system due to its significant reduction in operating costs.
- Enhanced warehouse efficiency is made possible through the utilization of new technologies, enabling faster and more precise operations in product search, picking, and movement.
- By implementing fully automated systems, the risk of human error in warehouses is minimized, ensuring greater accuracy and reliability.
- Furthermore, a smart warehouse allows staff to focus on more intricate and meticulous tasks. It also provides opportunities for skill development, making employees more valuable to the company.

OBJECTIVE

The objective of this research paper is to elaborate on the benefits of “Warehousing 4.0” in the context of achieving (environmental) sustainability and highlight relevant trends and practices used by the industry. It also provides a few relevant examples in this context.

RESEARCH METHODOLOGY

This research paper uses data from the Internet along with archival and observational research methods. Our understanding of the transportation and logistics industry and how technological changes are influencing

the industry and helping its digital transformation to achieve (environmental) sustainability is improved by the research findings. The literature review comprises studying relevant documents regarding smart warehousing, and the effects of warehousing 4.0, and industry 4.0 on the environment. This includes (i) articles from peer-reviewed articles; (ii) blogs and articles by logistics and warehousing companies; (iii) news from industry sources; and so on. The keyword “smart warehousing” is used for searching, in combination with some of the other words such as ‘sustainable environment,’ ‘waste reduction,’ OR ‘Industry 4.0.’

LITERATURE REVIEW

Referred to as TIMWOOD, there exist seven categories of waste, namely Transport, Inventory, Motion, Waiting, Over-Processing, Over-Production, and Defects attributed to Taiichi Ohno, of the Toyota Production System (TPS).

Autonomous Mobile Robots (AMRs) are utilized in a range of logistics environments, including warehouses, airport terminals, and healthcare facilities (Parikh et al., 2022).

Industry 4.0 (along with Warehousing 4.0) allows companies to adopt smart manufacturing through the utilization of Internet-connected technology to oversee production, utilize raw materials efficiently, and minimize carbon emissions. This technology has facilitated improved preventive maintenance to prevent unplanned equipment downtime, identify malfunctions, and decrease energy usage. (Sharma et al., 2024), (Tran, 2021), (Onaji et al., 2022), (Kumar et al., 2023).

Smart warehousing is resulting in Sustainability 4.0 as it combines Industry 4.0 and Warehousing 4.0. Businesses are increasingly prioritizing the delicate balance of sustainability objectives, considering people, the planet, and profit (Mendoza-del Villar et al., 2020).

The emergence of Sustainability 4.0 technology is revolutionizing the field, disrupting the traditional norms by providing insights and support to enhance sustainability performance, especially in manufacturing (Singh et al., 2022).

Sophisticated emission monitoring tools analyze emissions directly, correlating them with specific

processes, enabling businesses to adjust operational practices or process designs (Ramdan et al., 2020).

Regarding the environmental effects of warehousing, numerous authors have highlighted the significance of focusing on logistics as a key area. The introduction of smart warehousing has helped minimize the adverse impact on the environment. Through the use of robotics, automation, electrification, sensing technology, and IoT applications, storage systems are now being managed with greater efficiency (Rakhmangulov, 2017).

FINDINGS

Real-World Examples

In this section, the researcher would like to present a few examples of “Warehouse 4.0” as practiced and reported by industry sources.

In their article, titled “Industry 4.0 and the future of smart warehousing,” Birlasoft has provided some examples illustrating the use of smart warehousing (Birlasoft, n.d.).

- o Amazon utilizes a workforce of over 100,000 compact, wheeled robots known as “drives” in its 150 North American facilities. These robots, equipped with floor-mounted QR codes, efficiently navigate the premises and transport merchandise-filled shelves to workers responsible for order fulfillment. This serves as a remarkable illustration of how robots integrated with advanced sensors contribute to enhancing productivity, ultimately leading to improved turnaround times in the process of order fulfillment.
- o However, the efficiency of warehouse operations can be significantly improved by utilizing barcode scanners, smartphones, tablets, and smart glasses that seamlessly integrate with the current infrastructure. The integration of established technologies such as augmented reality (AR) can lead to an increase in picking productivity of nearly 25% and a reduction in picking errors by as much as sixfold. This ultimately guarantees that the products are delivered to customers at a considerably faster rate.

The study, (Kim, 2023) emphasizes the importance of energy-efficient systems, the Internet of Things, and

Big Data in promoting sustainability within this context. (See Table 1)

Table 1: Smart Warehousing and Environment Sustainability (Kim, 2023)

Warehousing System	Situation	Practical Use	Benefit to Organization
Energy Efficient System	Energy Conservation	Intelligent lighting and HVAC systems modify their operations according to the presence of occupants and specific requirements.	Reduced energy costs, improved environmental sustainability, and heightened comfort for employees.
IoT	Monitoring of Environmental Conditions	Sensors are utilized to track temperature, humidity, and various other environmental conditions within storage facilities.	Ensures the integrity of delicate products while adhering to safety regulations.
IoT	Managing the Energy Usage	Intelligent meters and sensors oversee and regulate energy consumption across a facility.	Minimizing energy expenses and ensuring a minimized carbon footprint.
Cyber-Physical Systems (CPS)	Efficient Energy Practices	Intelligent control systems modify lighting, ventilation, and various facility operations in response to real-time demands and environmental conditions.	Decreased energy usage, minimized operational expenses, and enhanced environmental sustainability.

Big Data	Analysis of Energy Usage	Examine energy consumption trends to identify inefficiencies and potential areas for optimization.	Less energy usage results in energy savings, minimized carbon emissions, and environmentally sustainable practices.
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As indicated in Table 1 above, smart warehousing is deploying Cyber-Physical Systems (CPS). Warehousing 4.0 innovations lead to the development of new technologies that streamline system management. The Cyber-Physical System (CPS) is capable of monitoring process performance by tracking and creating a virtual replica of the actual process. Moreover, the CPS shares similarities with the Internet of Things (IoT) concept, enabling seamless communication among all system components, resulting in cost savings and improved efficiency. (Buntak et al., 2019).

The researcher finds the following benefits of a few technologies that are widely used in warehouse 4.0.

- **RFID:** RFID technology helps to avoid sub-optimal transportation by providing the location of the nearest finished goods or raw materials, and unnecessary inventory by avoiding waiting/queueing by improved visibility. This reduces unnecessary movement of men and materials since the equipment and personnel do not retrack the paths resulting in savings of energy be it electric or fossil fuel which is positive for sustainability.
- **IoT:** IoT helps a warehouse to be aware of each SKU, whether stationary or moving. Since sensors are connected each asset gets tracked across the warehouse. The physical stock availability at the bin level is made known to the warehouse manager and serves as an early warning for low stock, wrong products, unwanted heat situations, pilferage if any, and so on. IoT helps in improved inventory management, real-time monitoring, and tracking which reduces unnecessary buying resulting in less transportation, less movement in receiving, and less motion in a warehouse thereby saving energy

as well as increasing efficiency. This is a positive for sustainability.

- **Autonomous Mobile Robots:** These are various types like AGVs (automated guided vehicles), ASRS (automated storage and retrieval system), collaborative robots working alongside humans, pick and place, goods to person, etc. They are used in picking, placing, sorting, packing, moving, etc.
- **Augmented Reality:** Augmented reality (AR) in warehouse operations can be compared to a Top Company official moving into a factory/warehouse and an employee assistant guiding him en route. AR does the same to a warehouse worker/picker. It shows the smallest/optimal route to the picker, helps focus items on bins, real-time updates on stocks, helps locate and pack items during peak hours, visual confirmations making sure that the right item goes to the right carton.
- **The Use of IoT and AI:** Smart warehousing can utilize both IoT and AI to enhance productivity, streamline operations, and capitalize on cost savings. Consequently, these technologies not only improve efficiency and minimize mistakes but also play a crucial role in establishing a sustainable supply chain.

CONCLUSION

The application of technologies like RFID, IoT, Autonomous Mobile Robots, and Augmented reality is helping in optimizing transportation within warehouses, locating materials, improving visibility, using sensors for inventory tracking, real-time monitoring, and replenishment, avoiding stock-outs, stock availability, efficiencies in picking packing by reducing movement of forklift, resulting in improving productivity and improving efficiency. Improvement in productivity and efficiency (basically) is achieved by reducing some of the “7 wastes.” This further results in reduced use of equipments, reduced lighting, and reduced movements which in turn means lesser use of energy and hence lesser use of fossil fuel.

The authors believe that as we are moving toward technological advancement, the shift to smart warehousing will not occur instantaneously. It necessitates investment, technological proficiency, and a dedication to change. However, the benefits - for the environment, our communities, and our businesses - are undoubtedly enormous. We find ourselves at a critical juncture where innovation and responsibility intersect, and the decision is evident: either we construct a future burdened by inefficiency and pollution, or we seize the opportunity to establish a sustainable, intelligent, and flourishing supply chain. The future of smart warehousing extends beyond the mere movement of goods; it signifies progress towards a superior world.

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Economic and Technological Variables Impacting Traditional and Crypto Currency Value

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ABSTRACT

Currency value is determined by a complex interplay of market-based, technological, and economic factors. Like national fiat money, conventional currencies are primarily influenced by macroeconomic variables like trade balances, inflation rates, and monetary policies. Purchase power is reduced by inflation, but currency strength can be increased by advantageous trade surpluses. On the other hand, cryptocurrencies like Ethereum and Bitcoin operate in a decentralized environment where value is influenced by network activity, mining costs, and technological expenditures. Cryptocurrencies are influenced by factors like investor sentiment, market liquidity, and limited coin production rather than trade or inflation like traditional currencies are. The costs associated with mining, such as energy consumption and technological advancements, also affect their value. As a result of speculative activity and quick shifts in market trends, cryptocurrencies typically exhibit higher volatility than conventional currencies. This essay looks at these conflicting

KEYWORDS: *Cryptocurrency, Traditional currency, Inflation, Interest Rate, Mining cost, Exchange fees.*

INTRODUCTION

The assessment of currencies, whether conventional or digital, has been the focus of considerable academic investigation, concentrating on the connections between numerous macroeconomic, financial, and technological factors. The principal concepts and methodologies associated with traditional currency and cryptocurrency valuation models underscore the economic theories, data analysis methods, and variables that influence currency values in these two contexts. Two models are built to evaluate economic and technological factors impacting currency worth, analyzing both conventional currencies and cryptocurrencies. The model will consider the key factors affecting each type of currency and the manner in which these factors influence their value. Here's a frame work for developing this analysis.

Traditional Currency Valuation Model

This portion of the model will concentrate on the economic factors that propel the value of traditional (fiat) currencies, like INR. Traditional denotes the value of the conventional currency, indicating that each factor impacts the value either positively or negatively. This negative and positive influence will be assessed through covariance between the currency and the factor. One graph is created to demonstrate the stability of conventional currency values over time in relation to inflation and interest rate fluctuations.

Cryptocurrency Valuation Model The second model will center on how cryptocurrencies obtain their value, which varies from traditional currencies. The technological and market-based elements affect cryptocurrency. Crypto signifies the value of the crypto currency, and

every factor exerts a distinct influence contingent on market conditions. The influence of the factors will be computed utilizing Monte Carlo simulation. Traditional currencies usually exhibit greater stability due to centralized oversight by governments and the predictable reactions of central banks to inflation and trade dynamics. Cryptocurrencies undergo more significant price fluctuations due to their finite supply, absence of central authority, and dependence on market sentiment and speculative actions. A chart has been prepared to demonstrate the volatility of cryptocurrency prices, featuring sharp peaks and troughs, affected by market sentiment and network activity/technological variables.

LITERATURE REVIEW AND RESEARCH GAP

Inflation and Interest Rates

The Fisher Effect, as described by Fisher (1930), asserts that nominal interest rates and inflation are intricately linked, influencing currency values. Higher inflation typically results in currency depreciation, whereas elevated interest rates can attract foreign capital, thus fortifying a currency (Mishkin, 2018). [2].

Trade Balance and GDP

The Mundell-Fleming model (Mundell, 1963), A nation's trade balance significantly contributes to currency valuation and affects the domestic currency. GDP growth is positively correlated with the currency value, whereas, a growing economy boosts investor confidence and foreign demand for domestic products. (Frankel, 2019). [3].

Monetary Policy and Political Stability

The monetary policies, interest rates, and quantitative modelling can profoundly impact currency values. For instance, the Taylor Rule (Taylor, 1993) indicates that central banks increase interest rates to control inflation and output gaps, which subsequently affect the exchange rate. Political stability is an important variable in currency valuation, as investors are inclined to invest in countries with stable government and default risk. (Bekaert and Harvey, 2000). [6].

Mining Costs

The cost associated with mining is a key factor in cryptocurrency valuation. Bitcoin's value, for instance, is affected by mining expenses, which encompass electricity charges, hardware, and adjustments in network difficulty (Yermack, 2013). [11] Numerous studies have indicated that mining costs can establish a lower limit for the price of a cryptocurrency, as miners are unlikely to persist in mining if the costs surpass the market price of the cryptocurrency (Ciaian et al. , 2016). [8].

Supply and Demand

The principle of scarcity plays a crucial role in cryptocurrency valuation. The capped supply of various cryptocurrencies, such as Bitcoin, is typically linked with elevated valuations due to the anticipation of future scarcity (Nakamoto, 2008). Additionally, supply models like the stock-to-flow ratio, which juxtaposes the scarcity of a cryptocurrency with its market value, have been suggested to forecast the prices of cryptocurrencies (PlanB, 2019). [7].

Market Sentiment and Network Health

Investor sentiment, encompassing the emotional perspective of investors, is another vital element influencing cryptocurrency valuations. Various studies have shown that positive news or sentiment (e.g., institutional acceptance, favourable regulatory news) can elevate prices, while negative sentiment can induce the contrary effect on additional network (Bouoiyour & Selmi, 2015).T

Technological Innovations and Regulation

Technological upgrades and regulatory factors are unique to the cryptocurrency market and have a significant impact on valuation. Protocol upgrades, such as Ethereum's transition to proof-of-stake (Ethereum 2.0), can increase the perceived value by improving scalability and reducing energy consumption. Conversely, regulatory events (e.g., government bans, taxation) can have substantial adverse effects on price (Zohar, 2015). [5]

RESEARCH GAP

Limited Cross-Market Valuation Models: Few studies have proposed a combined valuation model that integrates factors from both traditional and cryptocurrency markets. This research aims to fill this gap by creating a comparative framework.

Real-Time Data Integration: Current models predominantly use historical data, which may not capture real-time volatility or shifts in sentiment. This study aims to incorporate real-time data sources such as social media sentiment, transaction volume, and news events to improve accuracy.

Objectives

- To create a unified valuation framework
- To apply statistical and machine learning techniques
- To build a dynamic model that can predict cryptocurrency value.

RESEARCH METHODOLOGY

A comprehensive valuation model will be created for both traditional currencies and cryptocurrencies, let's break down the approach for each type and specify the data sources, methods, and analyses that will be essential for developing this model. The detailed framework is discussed in data analysis.

DATA ANALYSIS

1. Traditional Currency Valuation Model

$V_{\text{Traditional}} = f(\text{Inflation Rate, Interest Rate, Trade Balance, GDP, Monetary Policy, Political Stability})$

Key Variables and Their Economic Impact:

1. Inflation Rate: Higher inflation typically devalues a currency due to decreased purchasing power.
2. Interest Rate: Higher interest rates attract foreign investments, increasing currency demand and its value.
3. Trade Balance: A trade surplus generally 4. GDP: A growing GDP usually correlates with a stronger currency as it signals a robust economy.
5. Monetary Policy: Policies encouraging growth and investment can stabilize or strengthen currency

value.

6. Political Stability: Countries with stable political environments tend to have stronger currencies due to lower investment risk.

Analytical Steps

1. Data Collection: Gathered historical data on each variable for the past 10 years for the chosen traditional currency (e.g., INR).

Table1: Dependent Variables

Year	Inflation Rate (%)	Interest Rate (%)	Trade Balance	GDP (%)	Rs/ \$ rate
2013	10.92	7.75	-138	6.4	54.78
2014	6.37	8	-139	7.4	60.95
2015	4.91	7.5	-130	8	66.79
2016	4.95	6.5	-112	8.3	67.63
2017	3.33	6.25	-109	6.8	64.94
2018	3.95	6.5	-184	6.5	70.64
2019	4.76	5.15	-157	4	72.15
2020	6.62	4	-102	-6.6	74.31
2021	5.13	4	-106	8.9	75.45
2022	6.71	4.5	-122	6.8	81.62
2023	5.9	5.5	-120	6.1	82.58

Table 2: other factors for the same period

Monetary Policy Highlights	Political Stability
Tight	Moderate Stability
Transition	Change in Government
Policy rate cuts	Stable
Monetary Policy Committee	Stable
Gradual rate cuts	GST implementation
Moderate tightening	Moderate Challenges
Series of rate cuts	Stable
Aggressive cuts	COVID-19 Challenges
accommodative stance	Recovery Period
Gradual tightening	Stable
Balance between inflation and growth	Stable

Sources: World Bank, International Monetary Fund (IMF), central bank reports, government publications and FobsIndia.cm.

Covariance Analysis

- Measure the covariance between currency value and each variable to identify if they have a positive or negative effect.

- For example, the relationship between inflation and currency value would typically show a negative covariance.

Here are the covariance results between the currency value index and each variable:

- Inflation Rate: -10.30 (negative covariance)

This negative covariance indicates that when inflation increases, the currency value index tends to decrease, which aligns with the expectation that high inflation depreciates currency value.

- Interest Rate: -0.30 (slightly negative covariance)

Trade Balance: -18.40 (negative covariance)

GDP Growth Rate: 5.17 (positive covariance)

These results provide insights into how each economic variable may influence currency value trends over the analyzed period.

To analyze the covariance between the currency value and each variable (Inflation Rate, Interest Rate, Trade Balance, GDP Growth Rate) from the data collected, we need to calculate the covariance for each variable with currency INR/USD exchange rate over the same period.

Here are the results of the calculations:

Mean Values:

- Inflation Rate (%): 5.78
- Interest Rate (%): 5.97
- Trade Balance (USD Billion): -128.91
- GDP Growth Rate (%): 5.69
- INR/USD Rate: 70.17

Covariance with Currency Value (INR/USD Rate):

- GDP Growth Rate (%): -6.00
- Inflation Rate (%): -5.22
- Interest Rate (%): -8.79
- Trade Balance (USD Billion): 38.08

- Highlight periods of significant inflation or interest rate changes and examine corresponding effects on currency value. These visualizations, together with the covariance values, provide insights into how each factor influences currency value trends.

Cryptocurrency Valuation Model

$V_{\text{Crypto}} = f(\text{Mining Costs, Supply, Market Sentiment, Network Activity, Regulation, Technology Upgrades})$

Analytical Steps

Data Collection

Factors in the Cryptocurrency Valuation Model

1. Mining Cost (MC) : Refers to the cost of mining new coins, which includes electricity, hardware depreciation, labor, and other operational costs.

Formula: $MC = \text{Operating Cost} / \text{Coins Mined}$

2. Market Sentiment (MS) : Refers to the public's emotional outlook on the cryptocurrency, which can be derived from social media mentions, news sentiment, and influencer opinions. It Can be scored from -1 (very negative) to +1 (very positive). Sentiment score might range from 0.2 (slightly positive) to 0.8 (very positive).
3. Network Health (NH) : Measures the strength and reliability of the blockchain's network. It Includes factors like hash rate (proof of work) or staking rate (proof of stake), security vulnerabilities, and transaction throughput.

$NH = f(\text{hash rate, uptime, transactions per second})$

Example: Network Health score might range from 0 to 100, with 100 representing the healthiest network.

4. Nodes (N) : - The number of nodes (distributed network points) running the blockchain protocol. More nodes generally mean greater decentralization and security.

$N = \text{Number of Nodes} / \text{Total Nodes in the Ecosystem}$

5. Supply (S) : The total circulating supply of a given cryptocurrency. Supply influences scarcity, with a lower supply leading to higher potential value.

$S = \text{Current Circulating Supply} / \text{Max Supply}$

- Example: A ratio that could range from 0 to 1. If the circulating supply is 10 million coins, and the max supply is 21 million, the supply factor is 0.48.

6. Technology Advancement (TA): Refers to how advanced and innovative the technology behind the cryptocurrency is and Can be measured by protocol upgrades, improvements in scalability, privacy features, and consensus mechanisms.

TA = (Innovation Score + Development Activity)/ Total Technology Potential Example: A score from 0 (no innovation) to 1 (cutting-edge, highly scalable tech).

Data Structure for Valuation Model

Data collected: Gather historical data on mining costs, supply dynamics, sentiment indices, network activity, regulatory events, and major technology upgrades for the past 10 years.

Sources: Blockchain analytics (e.g., Glassnode, Chainalysis), news aggregators, GitHub for upgrade timelines, and regulatory publications.

Table 3: Cryptocurrency variables data

Crypto	MC	MS	NH	Nodes	S	TA	Price
BTC)	5,000	0.8	90	0.95	0.85	0.9	35,000
(ETH)	10,000	0.7	85	0.92	0.95	0.85	2,500
ADA)	4,000	0.6	80	0.88	0.75	0.75	1.2
(SOL)	3,500	0.9	92	0.97	0.6	0.8	100
(DOT)	6,000	0.65	88	0.93	0.7	0.7	25

Calculation Approach

Let's build a simple formula for calculating the valuation score based on the various factors:

Valuation Score = $\alpha \cdot MC + \beta \cdot MS + \gamma \cdot NH + \delta \cdot N + \epsilon \cdot S + \zeta \cdot TA$ Where:- $\alpha, \beta, \gamma, \delta, \epsilon$, and ζ are weights assigned to each factor based on the correlation coefficient between the factor and the cryptocurrency price. These weights must sum up to 1. Normalized value relative to other cryptocurrencies or converted price by fitting the score into a model based on historical data.

This model considers a variety of factors that can affect cryptocurrency valuation. By using these variables

and adjusting their weights, we can build a dynamic model that responds to changes in mining costs, market sentiment, network health, and other key metrics.

The volatility of a cryptocurrency (e.g., Bitcoin) with mining costs and network activity could visually illustrate these differences.

Scope

This study suggests that future research should focus on enhancing model accuracy through the use of machine learning and artificial intelligence to predict currency fluctuations based on real-time data. Moreover, the incorporation of behavioral economics into both traditional and cryptocurrency models could offer valuable insights into the irrational and speculative forces that drive currency valuations. By addressing these gaps, this research aims to contribute to more accurate, adaptive, and predictive currency valuation models that can better inform investors, policymakers, and researchers in the complex and rapidly evolving world of global finance.

CONCLUSION

The comparative analysis of both traditional and cryptocurrency valuation models reveals key similarities—such as the impact of supply-demand dynamics and the role of sentiment—and significant differences, particularly in terms of the technological factors that affect cryptocurrency prices. This research underscores the necessity for new, adaptable models that can account for both macroeconomic and microeconomic variables and their interactions in an increasingly digital and interconnected global economy.

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Entrepreneurship Eco-System and Critical Success Factors: A Review

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ABSTRACT

Entrepreneurship serves as the fundamental base for competitive advantage. It is an important tool for the business environment and forms a base for the economic growth of the country. The concept of entrepreneurship is always dynamic in nature. It can be related to innovation, discovery, creation, opportunities, risks and growth (Shane, 2012). The purpose of this article is to understand the entrepreneurship environment and key success factors that contributes to entrepreneurship. The entrepreneurial environment has become very competitive. It identifies the key trends in entrepreneurship and the factors that contribute towards success of entrepreneurship with the help of Scopus data base. The entrepreneurial environment should be supported with proper government initiatives and policy framework. It should pursuit with lot of opportunities. The internal and external business environment along with its factors like legal, economic, technological, technical, cultural factors serves as the fundamental basis for the survival of the business. Competitive factors like socio-economic, and technological have made the situation more challenging for the business models to survive. Entrepreneurship eco-system need to be encouraging. It will lead to innovation. Lot of entrepreneurship education programs presence have helped the global business to survive. To attain the knowledge on business environment and knowing about critical success factors objectives, articles pertaining to the above context are data are gathered from review of literature. The major success factors that are sighted in the review are entrepreneurial ideas, competencies, risk taking ability, leadership, entrepreneurial resilience, willingness cognition and ability cognition, general business environment, business models, managing capability, human resource analytics.

KEYWORDS: *Entrepreneurship environment, Critical success factors, Innovation.*

INTRODUCTION

Entrepreneurship serves as the fundamental base for business activities. A lot of businesses have survived because of the efforts rendered by the entrepreneurs. The concept of entrepreneurship is always dynamic. The concept is filled with a lot of innovation as per the study [1]. It serves as the base for the business environment. In this concept, we can categorise different forms of entrepreneurship. The concept of sustainable entrepreneurship forms the plinth to innovation and competitive advantage [2]. This concept has helped to attain new markets which leads to economic development and growth [3]. Another form of entrepreneurship named corporate entrepreneurship has grown within a decade due to factors like globalization, technological

innovations, and organizational factors. A novel form termed sustainable entrepreneurship which is also related to sustainability has been defined as a business approach which helps in building a strong business and long-term profitable business practices. It also helps in balancing environmental, business, and social activities [4]. Female entrepreneurship is another form of job creativity which has dominated the business circle in recent times. The major factors that contribute to the success of this concept are women's empowerment and women's development which contributes to economic growth [5] as per the study. United States, Australia, and the United Kingdom including India play a vital role in the women entrepreneurship concept. The evolving of new types of entrepreneurs and mounting interest in

the concept have created a new environment worldwide [6]. Several papers have highlighted the success factors.

This paper concentrates on the entrepreneurial ecosystem or environment, various critical factors that contribute to the success of entrepreneurship and the contribution of HR analytics towards sustainable entrepreneurship practices.

LITERATURE REVIEW

Entrepreneurial Eco-system and Critical Success Factors

The Global Entrepreneurship Monitor (GEM), has identified a wide change in the variety of activities carried out in entrepreneurship. This is due to the change in the education, culture and environment. There are different avatars of entrepreneurship. For sustainable entrepreneurship, it is important to have a good entrepreneurial ecosystem or environment. The entrepreneurial ecosystem is one of the important components of entrepreneurial success (Lazear, 2005). The belief in entrepreneurial success concept has seen a widespread interest and acceptance around the globe. One of the factors that contributes towards the ecosystem among many factors is business academics [7].

Maintaining the Critical Success Factors for growth

Earlier research has recognized key factors linked with entrepreneurial success, including risk-taking, self-efficacy, chance awareness, patience and perseverance including social skills [8]. Establishing connections and networks helps to contribute to the success of the business [9]. Market share and organization growth is a basic goal for SMEs [10] which helps the organization to sustain itself in the market. Customer retention develops as a vigorous component for maximum market share. [11] backing the goal that profit before interest and taxes, capital and market size are metrics of organization success as per their study.

Strategic capacity, such as learning and innovation, forms the base for resource growth and reaching competitive advantage within organizations. [12] in their study highlight individual and organizational learning. This has a positive effect on startup performance as per the study. Skill training and vocational education also form a part of learning that has contributed towards

the success of entrepreneurship. [13] has proved the above factors' contribution during their study on women entrepreneurship. The World Economic Forum has suggested and highlighted several factors of the eco-system environment that are much needed for entrepreneurship fundamentals. They are an Accessible Market which helps to fulfil customer needs, human resource management, a Support System established, a Regulatory Framework of the Government, an Education and Training and Development Centre, and Cultural awareness and support.

Entrepreneurs with access to capital, expertise in the specified area, funding, and human resources also form part of the success as per the study [14]. Talent is also one of the reasons for entrepreneurial success [15]. [16] the authors of different periods in their study bring to the reader's view that learning plays a vital role. Along with learning, entrepreneurship leadership are one of the important techniques in the proper eco-system. Individual creativity, updated knowledge of technology, and fostering innovation are also the main reasons for the entrepreneurial eco-system as per the study by [17].

Government support and community networks also support the nourishment and survival of entrepreneurship [18]. The latest review of the literature study by [19] insists human capital, human resource management play a vital role for the survival of the business. Education level and personal traits of the individual form the basis for the sustainable practice of entrepreneurship as per the study by [20] Further looking into the sustainable factors of advanced technology, involvement shown in the development of the business, motivation and government support also contribute as per the study by [21]. Design development, product invention, and team management constitute the fundamental management of the eco-system, sustainability and success factors as per the study by [22] [23]. in their study display knowledge, that facing socio-cultural challenges and overcoming them also leads to sustainability. The gut of uncertainty and behavioural control helps to achieve the stable goals of entrepreneurship as per the study by [24] [25]. Always having the intention to succeed called entrepreneurial success intention forms a firm base and critical factor for entrepreneurial success. Factors like self-confidence, vagueness tolerance, training retention, innovativeness, and self-achievement for

accomplishment have positively contributed to the above factor. The above forms the base of a strong entrepreneurial ecosystem anytime, anywhere.

Human resource Analytics, Artificial Intelligence and Entrepreneurship

In the increasingly competitive environment sustainability for the business is very important. Data and information related to business specifically self-employed business termed as entrepreneurship is vital. Entrepreneurs do make decisions based on data. Data related to human resource management is the fundamental pillar in modern days. It contributes towards the success of entrepreneurship and its sustainability. Information and data related to humans help to analyse and make important decisions on human resource management. It helps to describe, visualize and use statistics about the resources. This is called data-driven entrepreneurship. This concept tries to answer the role of HR analytics towards entrepreneurship. Human resource analytics is the systematic and logical method which helps to provide a better understanding and insights into human resources. One of the major features of human resource analytics is that it provides accurate prediction. [26] highlighted HR analytics as an indication-grounded approach.

[27] who has identified different qualities of entrepreneurship has highlighted that adopting technology as one of the major challenges for the concept. Human resource analytics provides better entrepreneurial and required outcomes like cost effectiveness, better strategies etc. Human resource analytics and its practices catalysed the development of entrepreneurship. It leads to innovation. The authors [28] have rightly pointed out that recruiting, selecting, and retaining new talents is the basic work for startups. As most of the startups lack in this, they must realize that these factors contribute to the success of the organization. As per the study by [29], trust, sharing of knowledge and commitment towards organizational goals also contribute to small and medium enterprises.

In the VUCA (volatility, uncertainty, complexity and ambiguity) gaining competitive advantage is possible through the implementation of modern predictive and prescriptive techniques on human resources will play a pivotal role as per the study. As per the research study

by [30] implementing proper human resource practices in startups will lead to innovativeness, improvement and success. HR analytics have helped to build resource capabilities in the organization [31] Artificial intelligence does play a vital role in providing the best human resource practices towards entrepreneurship. The technology provides an efficient workforce in startups [32]. The digital revolution has made organizations make use of big data to improve their efficiency The study by [33] highlights that AI adoption by startups has led to economic growth.

On the other hand, digital tool adoption by startups is for transformation and to bring new ways and means as per the study [34]. A study [35] brings out the importance of AI in entrepreneurship [36] interestingly in his study points that AI has been an influencer and have made the entrepreneurs adopt new strategy and procedures.

RESEARCH METHODOLOGY

Research questions

1. What is the present existing entrepreneurial eco-system in common and various critical success factors contributing towards the existence of entrepreneurship?
2. What is the role of human resource analytics towards entrepreneurship?

Objectives of the study

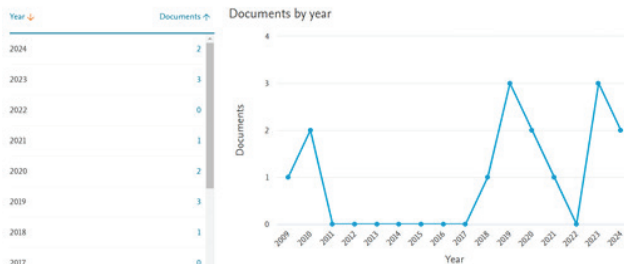
- To understand the existing entrepreneurial eco-system and various critical success factors contributing towards the existence of entrepreneurship.
- To analyse the role of human resource analytics towards entrepreneurship.
- To analyse number of papers published and which countries from contributed to the related to entrepreneurship concept.

The objectives are to be attained through review of literature.

Data collection

This paper is qualitative in nature. It was collected as review of literature. Pertaining to number of papers published in the field of entrepreneurship and success

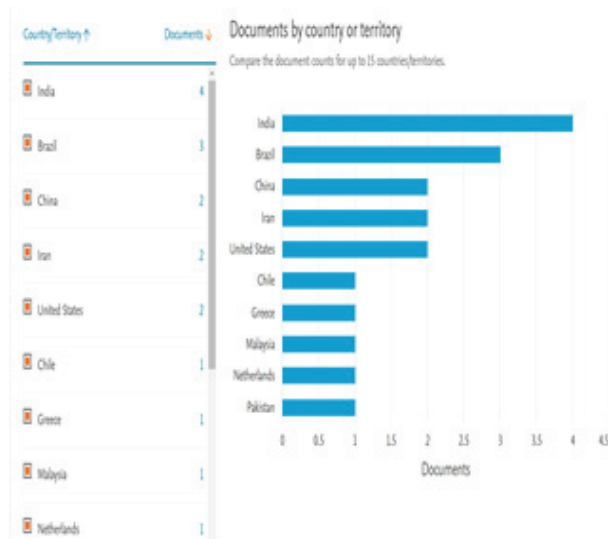
factors contributing to the concept were collected using Scopus data base.



Source: Author own sourced data

The above image shows that in 2024, 2 papers were published. In 2023, the number of papers dedicated were 3 papers in number.

Diagram 2 showing number of countries produced the most number of publications



Source: Author own sourced data

From the above diagram, countries like India, Brazil, Iran, United States and China have contributed to the more number of publications in the entrepreneurship concepts.

As per the review of literature critical success factors alike education, motivation traits, awareness programs, team management qualities, government support, good entrepreneurial eco-system, resource building capacity, community networks were the major critical success factors highlighted as per various studies. For sustainable success and practices, startups have

started to use AI, bigdata and social platforms. These modern techniques have helped the startups to grow and transform. HR analytics addresses the startups for data driven decisions and helps to solve challenges related to human resources [37]. HR analytics provide a high quality and reliable data to provide better and predictable future insights as per the study by [38]. The use of research ways and statistical tools by the start ups have provided competitive advantage.

CONCLUSION

The review study has tried to highlight various critical success factors and contribution of AI, HR analytics toward the success of the entrepreneurship. But it has only undertaken review of literature study. Regarding the entrepreneurship various dimensions like entrepreneurial intention, attitude and digital technologies contribution towards the success of startups can be carried out.

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Transforming Hospitality Waste Management with Smart Technologies

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ABSTRACT

This study delves into how cutting-edge technologies, like the Internet of Things (IoT), artificial intelligence (AI), and data analysis are reshaping waste management in the hospitality industry by hotels embracing systems, for better waste handling, such as collection and recycling, to cut expenses and align with eco objectives. This modernized approach improves effectiveness by reducing waste production and enhancing guest experiences to build a reputation. The research showcases waste management strategies utilized by well-known companies such as Hilton and Coca-Cola as examples of incorporating sustainability into their daily activities and processes while also addressing issues such as expenses and training for employees with suggestions on how to overcome these obstacles effectively. The study concludes by highlighting the progress in waste management technology alongside the significance of following circular economy principles to promote sustainability and enhance the performance of hotels. This investigation provides perspectives for hospitality executives looking to establish waste management plans.

KEYWORDS: *Artificial Intelligence (AI), The circular economy, The Internet of Things (IoT), Sustainability in hospitality, Smart waste management.*

INTRODUCTION

The hospitality industry places significant emphasis on sustainability, with waste management becoming a critical focus due to its substantial environmental impact. Hotels generate a considerable amount of waste, such as food leftovers and packaging materials, highlighting the importance of effective waste management to minimize environmental damage and enhance operational efficiency [1]. Proper waste management not only enables hotels to comply with regulations but also enhances their reputation, especially among travelers who value sustainability [2]

Hotels looking to uphold sustainability standards often find that traditional waste management methods struggle to manage the large quantity of waste generated by their operations. In response to this challenge and the rising environmental concerns from consumers and regulations alike, hotels are now finding it necessary to implement eco-waste management strategies to

remain competitive in the market while fulfilling their sustainability goals [3].

An Overview of Smart Waste Management Systems:

Advancements, in technology like the Internet of Things (IoT) and Artificial Intelligence (AI) have provided solutions for managing waste by improving collection methods and reducing costs through monitoring [4]. Leveraging these innovations enables hotels and other hospitality businesses to boost efficiency while maintaining quality standards and adopting innovative approaches. This study investigates the application of waste management systems in hotel settings to minimize waste generation. It showcases instances and provides recommendations for hotel executives to promote eco-friendly waste management practices.

OBJECTIVES

- To explore smart technologies for enhancing waste management in hospitality.

- To identify the environmental and operational benefits of smart waste management systems for achieving sustainability.

LITERATURE REVIEW:

Recent studies emphasize the importance of implementing waste management systems within the hospitality sector to enhance sustainability practices. The utilization of AI innovations can streamline waste collection processes and reduce environmental repercussions through enhanced operational efficacy, as demonstrated in [5]. The advantages associated with systems, particularly automation and recycling efforts leading to cost reductions, are further emphasized in [6]. However, some smaller hotels may find it challenging to cope with the investment required for these technologies.

Han and team's research delves into the incorporation of waste management, alongside efforts to conserve energy and water to establish a sustainability model that empowers hotels to achieve various environmental objectives simultaneously [5]. [8], emphasize the importance of intelligence in enhancing recycling rates within the hotel industry. All these studies highlight that while there may be expenses involved in implementing systems, the substantial long-term advantages make it a worthwhile investment for both large and small hotels.

The combined research indicates that innovative waste management technologies play a role in promoting sustainability goals. However, challenges related to scalability and cost still pose hurdles.

Adoption of Smart Waste Management in Hospitality

Emergence of Smart Waste Management Technologies:

The rise of waste management solutions has transformed the hospitality sector by utilizing real-time data gathering and analysis to enhance waste management practices significantly. Innovations, like the Internet of Things (IoT) along with Artificial intelligence (AI), have played a role in this evolution by offering precise waste level information through IoT sensors and optimizing collection routes and schedules using AI algorithms [6]. Thanks to these technological advancements, hotel waste management has become more efficient and ecofriendly today resulting in a reduced carbon footprint for hotel operations.

Drivers for Adoption in the Hotel Industry

There are reasons why hotels are turning to waste management systems these days; Government regulations are getting stricter, environmental rules are becoming more stringent, and hotels want to keep up by finding better ways to manage waste [7]. In addition, hotels are looking at these systems as a way to reduce costs and operate more efficiently. Smart systems help hotels save money on waste disposal and make it easier to manage resources effectively. As more and more guests want options, hotels see smart waste management as a key way to meet this need.

Integration with Other Sustainable Practices

Combining waste management with ecofriendly practices enhances environmental advantages significantly for hotels by merging waste management technologies, energy-saving techniques, and water conservation methods to establish a holistic sustainability framework [8]. This integrated approach boosts the sustainability of hotel operations and not only reduces environmental effects but also boosts brand image and guest satisfaction. An essential element in contemporary hotel management practices.

Pre-technology Waste Management Practices

Traditional Waste Management Methods

Before smart waste management systems became widespread in hotels, traditional manual approaches were the norm for handling waste collection and disposal. In the practice of using bins for waste collection and recycling, waste is regularly removed without consideration of bin capacity [9]. Waste is typically disposed of in landfills or incinerators, with an emphasis on recycling or resource reuse.

Challenges and Limitations of Traditional Systems

Conventional methods of waste management encountered obstacles. One notable issue was the lack of effectiveness caused by collection timetables, which resulted in bins being either full or inadequately used. This resulted in inefficiencies, as hotel workers had to allocate resources and time for collection. In addition, the segregation of waste was irregular, resulting in reduced recycling rates and increased waste production.

Environmental and Operational Costs

In the past, waste collection systems also had an effect on the environment as they depended on landfills and incineration, which led to carbon emissions and pollution according to [10]. Moreover, high operational expenses were incurred due to waste collection methods, resulting in increased transportation costs and labor expenditures [11].

Smart Waste Management Technologies in Hotels

Sensor-Based Waste Monitoring

Smart waste management technologies use sensors to track the amount of waste in bins in real-time. These sensors utilize IoT (Internet of Things) to give real-time information on waste capacity to facilitate an efficient collection schedule [12]. Through these systems, hotels can avoid overflows and avoid extra collection trips, thus improving their functionality.

Automated Waste Collection and Sorting

Automated waste collection involves the use of automatic and robotic means to transport waste from collection points to disposal centers [13]. Furthermore, segregated waste streams are sorted automatically using technologies such as Artificial Intelligence to separate Recyclable and Non-recyclable waste. This reduces the likelihood of human interference, thus enhancing recycling standards and dealing with waste in a more efficient and ecological manner.

Data-Driven Waste Reduction Strategies

It is evident that smart systems gather useful data that can be used to establish waste reduction initiatives. Hence, hotels can identify guests' waste production, optimize storage space and limit the amount and type of services and products that generate waste [14]. For instance, insights gathered from the data collected by sensor-based systems can reveal which areas of the hotel generate the most waste; thus, resource conservation efforts can be directed only to areas that require it. Thus, the hotel can obtain the optimal sustainable operating model.

Advantages of Smart Waste Management Systems

Reduced Waste Generation and Environmental Impact

The overall advantages of smart waste management are numerous; however, one of the most important is

a decrease in the amount of waste produced. Waste monitoring, which involves tracking waste generation and ensuring proper collection, enables hotels to contain wastage, thereby reducing their carbon footprint and the overall impact on the environment [15]. This is particularly relevant for sustainability targets in the hospitality sector.

Improved Recycling and Diversion Rates

Developers are creating smart waste systems that use AI to sort waste and separate recyclable items from non-recyclable ones. This leads to increased landfill diversion and decreased reliance on non-sustainable disposal options [16]. Hotels can then know how much waste is recycled and how much is sent to the dump to ensure that the facility complies with the law and its environmental standards to achieve sustainability objectives.

Cost Savings and Operational Efficiency

By automating the process of collecting waste and coordinating schedules efficiently in hotels, we can reduce the expenses associated with waste management [17]. The reduction in the number of collection trips resulted in decreased labor expenses and fuel consumption, which are beneficial for cost-cutting measures. Moreover, enhancing waste sorting practices and increasing recycling rates can reduce disposal charges, thereby improving hotel cost efficiency.

Enhanced Guest Satisfaction and Brand Image

Sustainability is now a critical component guests should consider when selecting a hotel. Adopting intelligent waste management systems demonstrates corporate leadership toward the environment and can improve the perception of a hotel brand and satisfaction among its guests [18]. A significant number of guests, especially those who value sustainable tourism principles, prefer to revisit hotels that promote environmental sustainability.

Challenges and Gaps in Implementation

High Upfront Costs and Financial Barriers

Smart waste management systems in hotels face one of the main constraints of high initial costs associated with technology [19]. Fixed sensors, AI-based sorting equipment and automation tools require significant

capital investment in the initial stages and are not easy for small hotels and chain accommodations with low capital to purchase.

Integration with Existing Infrastructure

Smart waste systems would need to be connected to a hotel's existing structures such as waste pick-up points, disposal zones, as well as other technologies [20]. Integrating smart waste management into existing structures or physical installations of structures can also pose significant challenges due to the high costs implicated in the process.

Lack of Staff Training and Awareness

Transitioning smoothly to waste management systems hinges on providing training, for personal to effectively utilize new technologies. Often, in the hospitality industry, employees may lack the know how to operate sophisticated waste monitoring systems [21]. Insufficient training could hinder the performance of these systems, thereby diminishing their efficiency.

Regulatory and Compliance Issues

Hotels must adhere to waste management rules to comply with regulations; however the regulatory landscape for waste management technologies is currently in flux [22]. It can be tricky for hotels aiming to adopt these systems on a scale to manage the changing demands effectively. Especially when ensuring data privacy for a sensor based monitoring setups.

Case Studies

Case study 1: Implementation of Smart Waste Monitoring Systems & Achieving Waste Reduction and Recycling Targets in Hilton Hotels:

In recent years, Hilton Hotels has taken the lead, in incorporating waste management systems to promote sustainability. They have implemented sensor-driven waste monitoring technologies that enable Hilton to monitor waste levels in time. This facilitates prompt waste collection, helps prevent instances of overflow [23]. This approach not only streamlines waste collection routines, but also reduces environmental impact by reducing unnecessary trips and emissions linked to waste transportation.

Hilton has effectively reduced waste and enhanced

recycling rates by utilizing systems in place [24]. By analyzing data gathered from waste monitoring systems to recognize patterns in waste generation and employ tailored waste reduction tactics based on this information; Hilton has successfully reached its sustainability goals, contributing to a circular economy by increasing the diversion of waste from landfills to recycling facilities.

Case Study 2: Integrating Sustainability across Hotel Operations & Leveraging Data to Drive Waste Management Decisions in Marriott International:

Marriott International has made sustainability a central part of its operations by implementing waste management strategies using cutting edge data analysis techniques to oversee and control waste throughout its locations [25]. This incorporation has resulted in improved resource efficiency and minimized environmental harm.

Marriott uses information from its waste management systems to make choices regarding reducing waste and promoting recycling initiatives effectively [26]. Through an analysis of waste data gathered over time, Marriott can pinpoint areas that need enhancement and put in place measures that boost recycling rates. This methodical approach not only helps Marriott achieve its sustainability objectives, but also enhances its effectiveness and cuts eventually run.

Case Study 3: Promoting a Circular Economy Model & Collaborating with Partners to Reduce Waste in Coca-Cola's Circular Economy Approach in Hospitality:

Coca-Cola has adopted a circular economy approach in the hospitality industry by prioritizing waste reduction and recycling initiatives. With the partnership of hotels, the company works together to establish recycling schemes aimed at collecting and repurposing packaging materials. This process effectively minimizes waste generation and promotes sustainability [27].

Coca Cola has teamed up with hotels and other hospitality businesses to create programs promoting waste reduction and recycling efforts [28]. These initiatives involve educating hotel staff on the best practices and offering the resources to boost recycling endeavors with the shared goal of diminishing the environmental footprint of waste, within the hospitality sector.

Comparative Analysis of Case Studies

Common Success Factors in Smart Waste Management

Hilton's strategy for success includes using data driven methods to improve waste management practices. A tactic also adopted by Marriott and Coca-Cola. By using technology, for waste monitoring and refining collection methods alongside boosting recycling rates in unison; they've managed to curtail harm while, simultaneously improving overall operational effectiveness.

Key Differences and Unique Approaches

Hilton focuses on timely waste monitoring, while Marriott emphasizes integrating sustainability into every aspect of its operations. Coca-Cola actively collaborates with partners to promote a circular economy and minimize waste. These distinct strategies highlight the diverse approaches each company employs to achieve their sustainability goals within the hospitality industry.

Impact of Smart Waste Management on Hotel Operations

Operational Efficiency and Cost Management

Incorporating waste management systems greatly improve efficiency by optimizing waste collection schedules and minimizing trips, resulting in cost savings, for waste management operations and reducing the environmental impact of hotels [29].

Employee and Guest Engagement in Sustainability

Implement waste management systems not only helps in promoting a sustainable mindset, among both employees and visitors but also improves the overall brand reputation of hotels by engaging staff, in waste reduction programs and educating guests on ecofriendly practices [30].

Future Trends in Smart Waste Management for Hospitality

Evolution of Smart Waste Management Technologies

The future of waste management, in the hospitality industry depends on the development of technologies like sensors powered by IoT and analytics driven by AI technology. These innovations will allow for better monitoring and control of waste disposal processes leading to a significant decrease, in environmental harm [31].

Integration with Circular Economy and Closed-Loop Systems

With a focus on sustainable practices in the hospitality industry, the combination of smart waste management and the principles of a circular economy will gain relevance. This entails developing systems that help to minimize waste while at the same time facilitating the reuse and recycling of waste materials to minimize waste production [32].

METHODOLOGY

This research employs a review-based methodology, analyzing existing literature and case studies on smart waste management technologies in the hospitality industry. The goal is to evaluate how technologies such as IoT and AI contribute to waste reduction and sustainability efforts.

Data Collection

Secondary Data: The study compiles information from academic journals, industry publications, and well-documented case studies to ensure comprehensive and reliable data. Key sources include works by [35], [9] and [31], which provide insights into the environmental and operational benefits of smart technologies. Additionally, case studies from Hilton, Marriott, and Coca-Cola were reviewed, offering practical examples of successful waste management implementations and their impacts on waste reduction, recycling, and cost savings.

Literature Selection and Review Process

The literature was selected from peer-reviewed journals and industry reports, focusing on publications from the last five years. Databases such as Google Scholar, ScienceDirect, Researchgate, Emerald Publishing and industry websites were used to source materials. Studies were selected based on their relevance to smart waste management, sustainability in hospitality, and the integration of advanced technologies.

DISCUSSION

In the hospitality sector, exploring waste management systems reveals an opportunity to reduce waste and enhance operational effectiveness significantly. Hotels can improve waste monitoring and management through the adoption of IoT- and AI-driven solutions

in real-time to optimize trash collection schedules and minimize waste production. The experiences of Hilton and Marriott serve as examples of how smart technologies have decreased waste by more than 20%, boosting recycling rates while simultaneously reducing operational expenses ([25]; [27]). These findings align with the insights of Sinha and Marques, which highlight the benefits of smart waste disposal systems for both environmental and financial outcomes.

Nevertheless, smaller hotels encounter obstacles in adopting these advancements due to the initial costs involved. Reza and Hassan [18], emphasize that while large hotel franchises can smoothly adopt these systems, smaller enterprises require support to address financial barriers. Moreover, the integration of infrastructure and the need for staff training further complicate the implementation process [21]. Real-world examples from industries and additional research support the claim that smart waste management systems not only help achieve sustainability objectives but also lead to long-term cost savings and enhance the reputation of businesses in the hospitality industry.

CONCLUSION

The integration of waste management systems is transforming the hospitality sector. Hotels are adapting to meet regulations and guests' rising sustainability demands by leveraging tools such as the Internet of Things, sensors and Artificial Intelligence automation. These technologies streamline waste collection and disposal, enhance waste handling, minimize harm, boost recycling rates, and improve operational efficiency, leading to cost savings and promoting conscious operations within the industry. By examining how Hilton and Marriott collaborated with Coca-Cola and implemented data-driven waste management strategies, it becomes clear that these approaches are crucial for meeting sustainability objectives. By adopting technologies and incorporating sustainability practices into their daily operations, these companies have reduced waste, improved recycling, and promoted a circular economy. Although significant upfront costs and implementation complexities pose challenges, lasting benefits, including enhanced brand image, reduced expenses, and increased guest satisfaction clearly outweigh the initial investment. Advances in the

Internet of Things, AI, and sustainable practices will continue to shape waste management in hospitality. Hotels that implement these technologies will achieve sustainability objectives and become leaders in environmental stewardship. By advocating policies and involving staff and guests in eco-friendly initiatives, hotels can make a meaningful difference while enhancing efficiency and reputation.

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Role of Linked Legitimacy in Sustainable Business Model Development

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ABSTRACT

This paper investigates the role of linked legitimacy as a critical resource in developing sustainable business models (SBMs) that integrate environmental, social and economic objectives. While SBMs are essential for organizations seeking to minimize negative impacts and create long-term value, the pathways for their development and scaling remain under explored. Linked Legitimacy, which involves building and sharing credibility among stakeholders, plays a central role in fostering collaborative innovation within business ecosystems. Through the highlighted case studies of Gecco, ArcelorMittal and Dumont; this research illustrates how these companies established linked legitimacy to drive sustainable innovations. The findings thereof suggest that linked legitimacy transcends traditional organizational boundaries, enabling decentralized collaboration and SBM growth. Key factors influencing SBM success include internal capacities, market alignment and external pressures such as regulatory frameworks. This study underscores the strategic value of linked legitimacy for firms advancing sustainability agendas and fostering innovation across entire ecosystems.

INTRODUCTION

Sustainability and Business Models:- As sustainability becomes increasingly prioritized by businesses, the adoption of sustainable business models (SBMs) that emphasize the triple bottom line - environmental, social, and economic benefits - is gaining momentum. Companies are expected to move beyond profit maximization and focus on creating broader value for society and the planet [1]

The transition to SBMs involves integrating sustainability at every level, from product design to resource use and stakeholder engagement. Business models (BMs) serve as frameworks for how organizations generate and capture value. SBMs, however, go further by embedding sustainability into these value-creation processes. By incorporating environmental and social goals, SBMs aim to balance financial performance with positive societal impact. Nonetheless, the pathways to effectively develop and scale SBMs remain under explored, particularly as businesses operate within complex, interdependent ecosystems. This research introduces linked legitimacy as an important enabler

of SBM development. Linked legitimacy is a resource generated when firms participate in sustainable projects, building credibility that can be shared across stakeholders in a business ecosystem. Unlike traditional legitimacy, which focuses solely on the firm, linked legitimacy is collective, benefiting multiple actors within a system. This research seeks to address the question: “How does link legitimacy facilitate the development and scaling of sustainable business models (SBMs) within collaborative business ecosystems?” By examining these three distinct case studies, the current paper attempts to explore how linked legitimacy can serve as a catalyst for sustainability-driven innovation and partnerships.

LITERATURE REVIEW

Understanding Sustainable Business Models (SBMs)

The concept of sustainable business models (SBMs) has evolved to encapsulate how firms create value while simultaneously addressing environmental, social, and economic impacts [2]. This involves reducing negative externalities such as resource depletion and

social inequities while enhancing overall value for stakeholders. SBMs are often seen as competitive differentiators for firms that proactively align with global sustainability trends [3].

Developing SBMs, however, is a complex endeavour that requires systemic thinking. Firms must innovate their processes, products, and partnerships to deliver sustainable solutions. This may involve changes to supply chains, stakeholder engagement strategies, and even governance structures to ensure that value is distributed equitably across the ecosystem.

Legitimacy in Business Ecosystems

The concept of legitimacy has been central to organizational theory [4]. It refers to the general perception that a firm's actions align with societal norms and values, gaining the trust of external stakeholders. In sustainability, legitimacy becomes crucial for businesses as it helps build relationships with partners, investors, and customers who value ethical practices.

Traditionally, legitimacy is firm-centered, meaning that companies work to build their reputation based on individual actions and achievements. However, sustainable development often requires firms to collaborate with multiple actors, from local governments to other businesses. In these cases, legitimacy can become a shared resource across an ecosystem, reflecting the joint efforts of all parties involved in sustainable initiatives.

Linked Legitimacy and Ecosystem Collaboration

Linked legitimacy extends beyond firm-specific actions and instead refers to the legitimacy created through collaborative engagement in sustainable development projects. In this way, multiple organizations within a business ecosystem share the legitimacy generated from their joint efforts to promote sustainability. Linked legitimacy allows firms to collaborate more freely, attract investment, and co-develop solutions that drive sustainability across the entire ecosystem.

By fostering shared credibility, linked legitimacy is crucial in scaling SBMs, enabling firms to innovate and implement sustainable practices more effectively. Thus, the idea of connected legitimacy is crucial to comprehending how companies move from focusing

on their own sustainability initiatives to having wider, ecosystem-wide effects.

METHODOLOGY

Case Study Approach

A multiple-case study methodology is used in this work to evaluate how connected legitimacy supports SBM development. The selected companies—Gecco, ArcelorMittal, and Dumont—are involved in sustainable development projects and intend to adapt their business models to comply with sustainability goals. These companies were chosen on the basis of their different approaches to sustainability, covering a wide range of industries and sizes of operation.

Data Collection

The study relies on semi-structured interviews, observations, and document analysis to gather data on how these firms developed linked legitimacy through their sustainability efforts. Interviews were conducted with company leaders, key partners, and external stakeholders, providing insights into their sustainability initiatives and collaborative practices. Secondary data from company reports, press releases, and sustainability-related documents were also reviewed to support the analysis.

Data Analysis

The data were analyzed thematically, with a focus on how linked legitimacy was built and used within each firm's ecosystem. A three-stage approach was employed:

- Within-case analysis to identify each firm's unique sustainability strategies,
- Cross-case analysis to explore common themes and differences,
- Synthesis to develop broader insights at the role of linked legitimacy in SBM development.

FINDINGS

Gecco case study

Background

Gecco, founded in 2007, focuses on the transformation of waste into renewable energy. Initially collecting used cooking oil from restaurants and converting it

into biodiesel, Gecco expanded its model to encompass other forms of waste management, driven by a strong commitment to circular economy principles.

Building Linked Legitimacy

Gecco's partnerships with key actors such as the City of Lille, McCain, and the University of Lille enabled the firm to build linked legitimacy in renewable energy and waste management. These partnerships facilitated access to resources, funding, and political support, making it easier for Gecco to scale its SBM. McCain's role, for example, was crucial in providing a stable supply of used oil, while the City of Lille's support demonstrated the firm's alignment with regional sustainability goals.

Impact on Sustainability

Through its partnerships and waste management innovations, Gecco has significantly reduced carbon emissions and contributed to energy autonomy in the region. Its ability to leverage linked legitimacy allowed it to attract EU funding and expand its operations, proving that collaborative legitimacy is essential for scaling SBMs.

Impact on Sustainability

ArcelorMittal's initiatives in industrial ecology have notably advanced environmental sustainability by curbing emissions, enhancing resource efficiency, and reclaiming energy. Notably, the district heating network—a collaboration with Dalkia—captures excess heat from the steel plant's blast furnaces to warm more than 6,000 homes and buildings in Dunkirk. Similarly, the DK6 power plant, a joint venture with Gaz de France, transforms steel production gas emissions into electricity. These projects not only improved ArcelorMittal's environmental impact but also facilitated the company in gaining linked legitimacy within its operational ecosystem.

The company's reputation as a sustainable leader in the steel sector was further solidified by its involvement in industrial ecology. This linked legitimacy attracted additional partnerships and investments, establishing ArcelorMittal as a pioneer in sustainable industrial practices.

Table 1: Principal Sustainability Initiatives at ArcelorMittal

Project	Description	Sustainability Impact	Linked Legitimacy Source
District Heating Network	Leverages waste heat from blast furnaces for local heating	Lower energy usage, reduced emissions	Energy Efficiency, Industrial Ecology
DK6 Power Plant	Converts gas emissions into electricity	Decreased carbon emissions, energy recovery	Emission Reduction, Circular Economy

Case Study: Dumont

Overview

Dumont, a family-owned firm; focuses on sustainable building installations, emphasizing energy efficiency, renewable energy, and eco-friendly housing construction. Despite a strong internal dedication to sustainability, Dumont encountered difficulties in market penetration due to its small scale and the emerging demand for sustainability in the construction sector.

Key Stakeholders and Linked Legitimacy

Dumont aimed to build linked legitimacy by participating in sustainability-oriented networks such as Club Noé and the Alliance. These networks allowed Dumont to connect with other businesses and stakeholders committed to sustainable construction. Nonetheless, Dumont struggled to achieve the same level of linked legitimacy as larger companies like Gecco and ArcelorMittal, primarily due to the absence of influential external partnerships or regulatory support.

The firm's difficulty in forming significant partnerships or generating market demand for its comprehensive housing solutions limited its ability to scale its sustainable business model. This case underscores the challenges faced by small firms in attaining linked legitimacy, particularly in sectors where sustainable practices are still developing.

Sustainability Obstacles

Dumont's challenges in securing crucial partnerships and market acceptance impeded the advancement of its

SBM. The absence of regulatory pressure and market demand for sustainable housing further obstructed the firm's ability to build linked legitimacy. This case illustrates that smaller firms often face greater obstacles in achieving linked legitimacy without substantial external support.

Despite these difficulties, Dumont continues to advocate for sustainable construction practices through industry associations and networks. As market and regulatory conditions evolve, Dumont may eventually leverage its early commitment to sustainability to build linked legitimacy and expand its business model.

Table 2: Challenges to Sustainability for Dumont

Barrier	Description	Sustainability Implication
Lack of Market Support	Resistance from developers to holistic, sustainable	Slower Adoption of SBM
Lack of external partnership	Having less engagement with large firms or regulatory entities	Difficulty in Scaling SBM
Internal resistance	Employee reluctance to embrace sustainable practices	Impeded Business Transformation

DISCUSSION

Importance of Linked Legitimacy in SBM Development

The case studies reveal that linked legitimacy is crucial for advancing sustainable business models (SBMs). By achieving legitimacy through sustainability projects, firms can gain trust and credibility within their business ecosystems. This linked legitimacy fosters collaborative innovation across organizational boundaries.

For instance, Gecco utilized the legitimacy from its biodiesel production to establish new partnerships and secure funding, thus broadening its SBM. ArcelorMittal's industrial ecology efforts bolstered its environmental reputation and attracted additional collaborations with energy firms. Conversely, Dumont's challenges in forming external partnerships restricted

its ability to scale its SBM, highlighting the significance of linked legitimacy in promoting ecosystem-wide sustainability efforts.

Linked legitimacy acts as a strategic asset for firms transitioning to SBMs, facilitating decentralized collaboration and resource sharing to meet common sustainability goals. It also aids firms in navigating complex regulatory environments and aligning with shifting market expectations for sustainability.

Internal and External Influences on Linked Legitimacy

The development of linked legitimacy is shaped by a mix of internal and external factors. Internally, firms must align their strategies with sustainability objectives and ensure stakeholder support. For example, Gecco's internal dedication to circular economy principles enabled its SBM creation and expansion. Conversely, Dumont's internal resistance hindered its shift toward a sustainable model.

Externally, market alignment and regulatory pressures are vital for fostering linked legitimacy. Firms in industries with robust sustainability regulations, such as ArcelorMittal in the steel sector, are more likely to build linked legitimacy. In contrast, Dumont's sector lacked adequate market and regulatory support, limiting its capacity to develop linked legitimacy and scale its SBM.

CONCLUSION

This study emphasizes the critical role of linked legitimacy in the advancement and scaling of sustainable business models. Linked legitimacy enables firms to build trust through sustainability initiatives, facilitating collaboration and innovation across business ecosystems. The hardliner experiences of Gecco, ArcelorMittal, and Dumont demonstrate various methods of leveraging linked legitimacy to advance SBMs. While Gecco and ArcelorMittal used linked legitimacy to attract funding and partnerships, Dumont faced challenges in achieving linked legitimacy without external support. The findings suggest that firms aiming to develop SBMs should focus on strengthening internal capabilities aligned with sustainability goals and seek external partnership to enhance linked legitimacy. Additionally, policymakers and regulators

can support SBM development by creating incentives for sustainability and promoting collaboration between large and small firms. In summary, linked legitimacy is a potent tool for advancing sustainability within business ecosystems. It encourages decentralized collaboration and shared value creation, enabling firms to develop SBMs and contribute to broader environmental, social, and economic sustainability objectives.

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The Role of Faculty Development under NEP 2020: Analyzing its Effects on Student Learning in Sangli's Higher Education Institutions

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ABSTRACT

This research work investigates the influence of faculty development initiatives, as outlined in India's National Education Policy (NEP) 2020, on the academic achievements of students in higher education institutions located in the Sangli region. The NEP 2020 prioritises the ongoing professional development of educators as a crucial factor in enhancing the standard of education. This study employs a mixed-methods approach, which involves analysing student performance data using quantitative methods and gathering qualitative perspectives through interviews with staff and students.

The results demonstrate a strong association between teacher development initiatives and improved student learning outcomes. Faculty members who took part in training programs linked with the National Education Policy (NEP) reported a boost in their confidence to apply new teaching methods. This, in turn, resulted in enhanced student involvement and academic success. The investigation moreover highlights obstacles in the present execution of faculty development programs, encompassing constraints on resources and disparities in institutional backing.

In summary, the research highlights the significance of continuous investment in faculty development as a vital component in attaining the goals of NEP 2020. The study provides recommendations for politicians and educational institutions to bolster teacher development initiatives in order to significantly improve student learning outcomes in the region.

KEYWORDS: Faculty development, NEP 2020, Student learning outcomes, Higher education, Sangli region.

INTRODUCTION

The National Education Policy (NEP) 2020 represents a noteworthy achievement in the development of India's educational framework, with the objective of overhauling the system to align with the requirements of the 21st century. An essential aspect of this program is the prioritisation of faculty development, acknowledging the direct correlation between the quality of education and the quality of

teaching. In the realm of higher education, faculty members have a broader responsibility than simply imparting knowledge. Their duty includes fostering the development of critical thinking, creativity, and a lifetime commitment to study in students. Thus, faculty development is not merely an administrative obligation, but a crucial imperative to improve educational results.

The NEP 2020 emphasises the need for educators to undergo thorough and ongoing professional

development. This includes receiving innovative training in teaching methods, being exposed to the finest practices from around the world, and prioritising the holistic development of students. The strategy aims to create an education system in which faculty members are equipped with the most up-to-date tools and methodologies, promoting an atmosphere that is favourable for both teaching and learning at a high level.

Within the setting of Sangli, a region renowned for its dynamic educational ecosystem, the execution of NEP 2020's faculty development programs offers a distinct chance to assess their tangible effects in the real world. The higher education institutions in Sangli, which encompass both urban and rural environments, serve as a fair example of the challenges and opportunities that educational institutions throughout India encounter. Gaining a comprehensive understanding of how these programs impact student learning results in this specific location can provide significant insights for policymakers and educators across the country.

This study aims to evaluate the efficacy of faculty development programs implemented under the National Education Policy (NEP) 2020 in higher education institutions in Sangli. The study seeks to contribute to the wider discussion on educational reform in India by analysing the correlation between these initiatives and student learning results. The primary enquiries driving this investigation are: To what extent have faculty development initiatives impacted teaching methodologies in the higher education institutions of Sangli? What is the influence of these methods on student involvement and academic performance? What are the difficulties and factors that facilitate the execution of these initiatives?

The study aims to explore the impact of faculty development on educational quality and provide evidence-based recommendations for improving these programs within the NEP 2020 framework.

Objective

- To evaluate the impact of faculty development programs under NEP 2020 on the teaching practices of higher education faculty in Sangli.
- To analyze the correlation between faculty development initiatives and student learning outcomes in Sangli's higher education institutions.

- To identify the challenges and opportunities in the implementation of NEP 2020's faculty development initiatives in the Sangli region.

Significance of the study

The importance of this study is in its capacity to provide significant knowledge regarding the execution and efficacy of faculty development programs under NEP 2020, particularly within the higher education institutions in the Sangli region. Comprehending the tangible effects of NEP 2020 on teaching and learning is crucial for educators and policymakers, as it signifies a significant change in India's educational policy.

This study offers empirical information on the impact of faculty development programs on teaching methods and student learning outcomes, contributing to educational reform. These insights are crucial for assessing the effectiveness of NEP 2020 and informing future policy choices on faculty development.

The results of this study can assist educational institutions in Sangli and other areas in gaining a deeper understanding of the particular elements of faculty development that have the greatest impact on improving teaching quality. This can result in the development of more focused and effective training programs, thereby enhancing the overall standard of education.

The report provides pragmatic suggestions for policymakers on enhancing faculty development activities, specifically targeting the identified issues in the research. These recommendations can provide valuable insights for the development and execution of future programs, ensuring that they are more closely tailored to the requirements of educators and students.

This study focusses on the local effects of national education policy in the Sangli region, serving as a replicable model for similar educational contexts throughout India. The study's emphasis on a particular location enhances the comprehension of how NEP 2020 is being executed at the local level.

The study's conclusions have wider ramifications for higher education institutions throughout India, extending beyond the particular context of Sangli. The study contributes to the global discussion on enhancing higher education through professional development by

examining the connection between teacher development and student outcomes.

Overall, this study has importance as it not only assesses the tangible results of a crucial component of NEP 2020 but also offers practical insights that can facilitate additional enhancements in India's higher education system.

Hypothesis

H1: Faculty development programs under NEP 2020 have a positive impact on the teaching practices of higher education faculty in Sangli, leading to the adoption of more innovative and effective instructional strategies.

H2: There is a significant positive correlation between the participation of faculty in NEP 2020-aligned development programs and improved student learning outcomes in Sangli's higher education institutions.

REVIEW OF LITERATURE

Reddy and Prasad (2020) explore the critical role of faculty development in driving pedagogical innovation within higher education. Their study, published in the *Journal of Education and Practice* (Vol. 11, No. 4, pp. 34-45), argues that continuous professional development programs are essential for equipping educators with modern teaching strategies that foster more effective and engaging classroom practices. The authors emphasize that these programs not only enhance the pedagogical skills of faculty members but also promote the adoption of innovative approaches that significantly improve student learning outcomes. The study concludes that faculty development is a key catalyst for educational transformation in higher education institutions.

Sharma (2019) investigates the impact of faculty training on student academic performance within Indian higher education institutions, as detailed in the *Indian Journal of Higher Education* (Vol. 31, No. 2, pp. 67-78). The study reveals a significant positive correlation between faculty training programs and student academic outcomes. It highlights that faculty members who undergo rigorous training are better equipped to implement effective teaching practices, which in turn enhances student learning and performance. Sharma's research underscores the importance of investing in

faculty development to improve educational quality and achieve better student success rates in higher education.

Kumar and Singh (2018) address the challenges hindering effective faculty development in Indian universities in their article published in the *Journal of Educational Research* (Vol. 23, No. 3, pp. 92-105). The study identifies several barriers, including inadequate funding, insufficient institutional support, and faculty resistance to adopting new teaching methodologies. The authors argue that these obstacles undermine the potential benefits of faculty development programs and call for a more supportive infrastructure and better resources to facilitate successful implementation and adoption of faculty training initiatives.

Patil and Deshmukh (2021) provide an in-depth analysis of faculty development initiatives under NEP 2020 in their article published in the *Journal of Educational Policy and Practice* (Vol. 27, No. 2, pp. 44-58). The study evaluates how NEP 2020's emphasis on continuous professional development is being translated into practice across higher education institutions. The authors discuss various aspects of the policy, including the integration of modern teaching practices and global best practices into faculty training programs. They highlight both the achievements and the challenges faced in implementing these initiatives, offering insights into how they can be enhanced to better meet educational goals.

Verma (2018) explores how faculty development programs can enhance student engagement in her article published in the *Journal of Educational Innovation* (Vol. 22, No. 1, pp. 76-89). The study demonstrates that faculty development initiatives that focus on interactive and student-centered teaching methods significantly improve student engagement and participation. By equipping educators with innovative teaching strategies and tools, these programs enable them to create more dynamic and participatory learning environments, which in turn leads to better student involvement and learning outcomes.

Verma (2018) examines the role of faculty development programs in enhancing student engagement in her article published in the *Journal of Educational Innovation* (Vol. 22, No. 1, pp. 76-89). The study finds that faculty development programs focused on modern pedagogical

techniques significantly boost student engagement. By training educators in interactive and student-centered teaching methods, these programs help create more engaging and participatory learning environments. The research highlights that improved faculty skills in these areas lead to increased student participation and interest, thereby enhancing overall learning experiences and academic outcomes.

Kapoor and Mehta (2017) assess the impact of faculty development programs on teaching effectiveness in their study published in the *Indian Journal of Teacher Education* (Vol. 28, No. 4, pp. 123-135). The research reveals that faculty development programs significantly improve teaching effectiveness by enhancing educators' pedagogical skills and instructional strategies. The authors evaluate various development initiatives and their direct effects on teaching practices, concluding that well-structured faculty training leads to more effective teaching methods and better learning outcomes. The study underscores the importance of continuous professional development in achieving high teaching standards in higher education.

Singh (2020) explores the specific challenges and solutions for faculty development in rural higher education institutions in her article published in the *Journal of Rural Education and Development* (Vol. 16, No. 2, pp. 50-63). The study highlights the unique needs of educators in rural settings, such as limited access to resources and professional development opportunities. Singh proposes tailored strategies to address these challenges, including localized training programs and enhanced support structures. The research emphasizes that addressing the distinct needs of rural institutions is crucial for improving faculty effectiveness and overall educational quality in these areas.

Mishra (2019) investigates the role of technology in faculty development under NEP 2020 in her article published in the *Journal of Educational Technology* (Vol. 15, No. 3, pp. 88-101). The study explores how technological tools and platforms are being utilized to enhance faculty training and professional growth. Mishra highlights that technology facilitates access to a wide range of educational resources, enables virtual training sessions, and supports the integration of modern teaching methodologies. The research underscores that

leveraging technology effectively can significantly improve the reach and impact of faculty development programs, particularly in bridging gaps and fostering continuous professional growth in line with NEP 2020's objectives.

Bhatia and Choudhary (2018) explore how faculty development programs serve as a pathway to career advancement in academia in their article published in the *Journal of Higher Education and Management* (Vol. 13, No. 2, pp. 134-147). The study examines the link between participation in faculty development initiatives and career progression for educators. The authors find that engaging in professional development not only enhances teaching skills but also contributes to career growth, including opportunities for promotions and increased recognition within academic institutions. The research highlights the dual benefits of faculty development, demonstrating its role in both improving educational quality and advancing academic careers.

Gupta and Sen (2021) investigate faculty perceptions of professional development programs under NEP 2020 in their article published in the *Journal of Teacher Development* (Vol. 29, No. 1, pp. 66-79). The study explores how faculty members view these development initiatives, focusing on their experiences and satisfaction with the programs. The authors find that while many educators acknowledge the benefits of professional development, including improved teaching practices and enhanced skills, there are concerns about the practical applicability of some training aspects and the adequacy of support provided. The research highlights the need for continuous feedback and adjustments to ensure that professional development programs meet the needs and expectations of faculty members effectively.

Chakraborty (2020) provides a comparative analysis of faculty development models in Indian higher education in her article published in the *Indian Journal of Comparative Education* (Vol. 20, No. 4, pp. 99-112). The study examines various faculty development models implemented across Indian institutions, evaluating their effectiveness and impact on teaching and learning. Chakraborty identifies key best practices and strategies from different models, offering insights into how these approaches can be optimized to improve faculty training and professional growth. The research

highlights the diversity of faculty development practices and provides recommendations for adopting successful elements across the broader educational landscape.

Comparison from data collected from Review of literature

Comparison of Studies on Faculty Development

1. Pedagogical Innovation vs. Student Learning Outcomes

Reddy & Prasad (2020) focus on how faculty development serves as a catalyst for pedagogical innovation, emphasizing the role of development programs in equipping educators with modern teaching strategies that enhance classroom practices. In contrast, Sharma (2019) directly measures the influence of faculty training on student academic performance, providing empirical evidence of the positive correlation between well-trained faculty and improved student outcomes. While Reddy & Prasad highlight the indirect effects through enhanced pedagogical methods, Sharma quantifies the direct impact on student learning.

2. Challenges in Faculty Development vs. Implementation under NEP 2020

Kumar & Singh (2018) identify barriers to effective faculty development, such as inadequate funding and resistance to new methods, which hinder the successful implementation of training programs. On the other hand, Patil & Deshmukh (2021) analyze faculty development initiatives specifically under NEP 2020, examining how the policy aims to address these challenges and improve faculty training. While Kumar & Singh focus on general issues, Patil & Deshmukh provide a policy-centered perspective on overcoming these barriers.

3. Regional Implementation vs. National Framework

Joshi (2022) presents a case study on the implementation of faculty development under NEP 2020 in the Sangli region, offering insights into localized challenges and successes. This regional focus contrasts with the broader analysis provided by Patil & Deshmukh (2021), who evaluate NEP 2020 initiatives on a national scale. Joshi's study provides practical examples from a specific area, while Patil & Deshmukh offer a comprehensive overview of policy implementation across India.

4. Student Engagement vs. Teaching Effectiveness

Verma (2018) investigates how faculty development programs enhance student engagement through interactive teaching methods. In contrast, Kapoor & Mehta (2017) assess the overall impact of faculty development on teaching effectiveness, including various aspects of instructional quality. Verma's research focuses specifically on student engagement as a measure of effectiveness, whereas Kapoor & Mehta provide a broader evaluation of teaching improvements.

5. Rural vs. General Faculty Development

Singh (2020) addresses the unique challenges of faculty development in rural higher education institutions, emphasizing the need for context-specific solutions. In comparison, Kumar & Singh (2018) and other studies address faculty development challenges in a more general context. Singh's study highlights the distinct needs of rural institutions, while other studies provide insights applicable to a wider range of settings.

6. Technology-Enhanced Development vs. Traditional Approaches

Mishra (2019) explores how technology facilitates faculty development under NEP 2020, highlighting the role of digital tools in enhancing training programs. This contrasts with the more traditional approaches discussed in other studies, such as those by Kapoor & Mehta (2017) and Reddy & Prasad (2020), which focus on conventional pedagogical methods and face-to-face training. Mishra's research emphasizes the transformative potential of technology in modernizing faculty development.

7. Career Advancement vs. Professional Development

Bhatia & Choudhary (2018) discuss how faculty development contributes to career advancement, linking professional growth with academic career progression. This is somewhat distinct from Gupta & Sen (2021), who focus on faculty perceptions of professional development programs under NEP 2020. While Bhatia & Choudhary emphasize career benefits, Gupta & Sen provide insights into faculty attitudes and experiences regarding development programs.

8. Comparative Models vs. Specific Initiatives

Chakraborty (2020) offers a comparative analysis of different faculty development models in Indian higher education, identifying best practices and strategies. This contrasts with the specific initiatives and case studies discussed in other research, such as Joshi (2022) and Patil & Deshmukh (2021), which focus on particular implementations and policy analyses. Chakraborty's study provides a broader perspective on various models, while others offer detailed insights into specific programs and policies.

The studies collectively provide a comprehensive understanding of faculty development, highlighting different aspects such as pedagogical innovation, challenges, regional implementation, and the impact of technology. Each study offers unique insights, ranging from practical case studies to theoretical analyses, and together they paint a multifaceted picture of faculty development under NEP 2020 and beyond.

DATA ANALYSIS

Demographic analysis

Section 1: Demographic Information

Age		
	Respondents	% age
25-34	5	10
35-44	27	54
45-54	13	26
55 and above	5	10
Total	50	100

Majority of respondents were from 35-44 years age group(54%)

Gender:		
	Respondents	%age
Male	27	54
Female	23	46
Total	50	100

Years of Teaching Experience:		
	Respondents	%age
0-5 years	6	

6-10 years	15	30
11-15 years	8	16
16-20 years	15	30
21 years and above	6	12
Total	50	100

Majority of respondents were found 6-10 years teaching experience (30%) , also 16-20 years experiences (30%).

Highest Educational Qualification:		
	Respondents	%age
Master's Degree	23	46
M.Phil.	3	6
Ph.D.	24	48
Other (Please specify)	0	0
Total	50	100

Majority of teaching staff is highly qualified, 48% of staff have Ph.D degree.

Type of Institution:		
	Respondents	%age
Government	23	46
Private	20	40
Autonomous	7	14
Others (Please specify)	0	0
Total	50	100

Respondents were 46% from government institution, 40% from private colleges and 14% of respondents were from autonomous colleges.

Number of Faculty Development Programs Attended in the Last 3 Years:		
	Respondents	%age
0-1	5	10
2 to3	27	54
4 to 5	15	30
6 and above	3	6
Total	50	100

Majorly all respondents attended at least one Faculty development program. Its found that 54% of respondents were 2 to 3 faculty development program attended, 30%

of respondents were 4 to 5 faculty development program attended.

Hypothesis Testing

H1: Faculty development programs under NEP 2020

From the Anova test

ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	35.42857	6	5.904762	4.734761	0.00	2.125037
Within Groups	1167.5	343	3.40379			
Total	1202.929	349				

Its found that $F > F_{crit}$ ($4.734761 > 2.175037$) and p-value is 0.00, means alternative hypothesis is accepted, there is impact of FDP on the teaching practices of higher education faculty.

have a positive impact on the teaching practices of higher education faculty in Sangli, leading to the adoption of more innovative and effective instructional strategies.

H2: There is a significant positive correlation between the participation of faculty in NEP 2020-aligned development programs and improved student learning outcomes in Sangli's higher education institutions.

Correlation Analysis

	A	B	C	D	E	F	G
A	1						
B	0.707707784	1					
C	0.664308245	0.391446	1				
D	0.300350474	0.525409	0.529311	1			
E	1	0.397385	0.335898	1	1		
F	0.969873222	1	0.484624	0.510593	0.441445	1	
G	0.89080476	0.805953	0.820742	0.166339	0.206989	0.544518	1

A	There has been a noticeable improvement in my students' academic performance after I implemented strategies from faculty development programs.
B	My participation in NEP 2020-aligned programs has led to higher levels of student engagement in my classes.
C	Students have provided positive feedback about the new teaching methods I have adopted from faculty development training.
D	The training has enabled me to better assess and support student learning outcomes.
E	My students' critical thinking and problem-solving skills have improved as a result of the new instructional strategies I use.
F	There is a positive change in the overall classroom environment after I applied techniques learned in faculty development programs.
G	I believe that faculty development under NEP 2020 has directly contributed to my students' academic success.

From the above table, it is clear that major parameters are correlated to each other. Means there is a significant positive correlation between the participation of faculty

in NEP 2020-aligned development programs and improved student learning outcomes.

DISCUSSION

The literature study explores faculty development within the framework of NEP 2020, highlighting its effects, difficulties, and possibilities. It highlights the significant influence of teacher development programs on various aspects of higher education, such as promoting new teaching methods, improving classroom practices, and enhancing overall educational quality. Research by Reddy & Prasad (2020) and Kapoor and Mehta (2017) also supports these findings, indicating that allocating resources towards faculty training not only enhances teaching approaches but also improves overall educational quality.

Sharma (2019) and Verma (2018) highlight the connection between faculty training and student academic achievement, emphasizing the importance of well-designed training programs in promoting interactive and participatory learning environments. However, challenges in the execution process include insufficient financial resources, lack of organizational backing, and reluctance to embrace change. Joshi (2022) provides a geographical viewpoint, analyzing the difficulties encountered in the Sangli region within the framework of NEP 2020.

Technology plays a growing role in faculty development, with studies like Mishra's (2019) study examining how digital tools and platforms can improve faculty training in accordance with the National Education Policy (NEP) of 2020. Singh (2020) examines the distinct requirements of faculty development in rural higher education institutions, highlighting the need for customised solutions due to limited resources and unique difficulties.

Perceptions and career progression are crucial for the effectiveness of faculty development programs, with Gupta & Sen (2021) arguing that faculty members have reservations regarding their actual implementation and support. Chakraborty's (2020) study examines faculty development models, focusing on identifying optimal strategies and highlighting the limitations of a universal approach.

Policy and practice implications emphasize the need to tackle both difficulties and possibilities in faculty growth. Policymakers and educational leaders should

prioritize enhanced support, technology integration, contextual adaptation, ongoing evaluation, and career development. By prioritizing these specific areas, higher education institutions can improve the quality of instruction and student achievements, making a valuable contribution to the overarching objectives of NEP 2020.

CONCLUSION

The examined papers highlight the significant impact that faculty development initiatives in higher education can have under NEP 2020. Faculty development is essential for strengthening pedagogical techniques, promoting teaching effectiveness, and increasing student engagement and academic success. Multiple studies provide evidence that carefully planned development initiatives can have a substantial effect on the quality of education. These programs educate educators with the essential skills and tactics to adapt to changing teaching requirements and create more engaging learning environments. Nevertheless, the success of these programs relies on addressing substantial obstacles such as insufficient finance, opposition to change, and the necessity for solutions tailored to specific contexts.

To tackle these difficulties, authorities and educational institutions must employ a comprehensive strategy that incorporates technological improvements, offers sufficient assistance, and customises programs to fit regional and institutional circumstances. Regular input from professors and a concentration on chances for professional growth can further improve the effectiveness of development programs. By focussing on these specific areas, higher education institutions can more effectively comply with the objectives of NEP 2020 and attain enhanced teaching outcomes and student success.

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Familiarity of Indian Investors with Value Investing: An Empirical Investigation

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ABSTRACT

The cornerstone of ‘value investing’ is selecting stocks that seem to be trading below their ‘intrinsic value’ or ‘book value.’ The calculation of ‘intrinsic value’ is not necessarily in absolute terms but rather a fair estimation that a stock’s fundamentals are strong enough to hold more value than its current market price. As a long-term investment approach, value investing requires patience and faith in the company’s core principles. In order to investigate whether Indian investors are familiar with the concept of value investing and whether they actually practice value investing or not, this paper examines the views of Indian investors in terms of three fundamentals: “the low price-to-book ratio, the low price-to-earnings ratio, and the high dividend payout ratio.” This has been done with the help of simple aggregation, percentages, mean score, and Levene’s t-test using Microsoft Excel worksheets and SPSS software. Results showed that value investing exists in the Indian stock market in terms of the parameters analysed in this study. Furthermore, there is “no statistically significant difference between the views of males and females” on value investing.

KEYWORDS: *Value investing, Price to earning ratio, Dividend payout ratio, Price to book ratio.*

INTRODUCTION

Value investing was first introduced by Benjamin Graham as “The Value Approach to Stock Investment” and is now widely used by Warren Buffet and Charlie Munger. A competent value investor invests in safe, high-quality, and inexpensive companies while maintaining a substantial margin of safety, and they place equal weight on the financial market’s psychological component. Selecting stocks that appear to be trading below their intrinsic or book value is the fundamental tenet of value investing.

One of the prominent pillars of value investing have evolved over the period. At first, it was thought to be comparable to the book value of the company’s assets. This concept of intrinsic worth was quite strong, but it was completely useless because neither the average earnings nor the average market price showed any signs of being manipulated by the book value. Thus, a fresh viewpoint that the intrinsic value of a corporation was

defined by its “earning power” replaced this approach. The calculation of intrinsic value is not necessarily be in absolute terms rather a fair estimation that a stock’s fundamentals are strong enough to hold value more than its current market price. This difference between market price and intrinsic value is known as margin of safety which have been a protecting guide to value investors even in their hardest of time. The guidance of Graham and Dodd for determining intrinsic value utilizing advocates for earnings power such as prior year earnings, previous dividends, prior sales, and consensus future earnings predictions. The timing of anticipated cash dividends, the risks associated with those distributions, and the liquidity of overall investment are just a few value-relevant aspects that are ignored by this approach of calculating a security’s relative worth.

Value investors contend that both positive and negative news are overreacted to by the market, causing stock price fluctuations that are inconsistent with a company’s long-term fundamentals. By taking advantage of this

mispricing, they can make exceptional profits. To put it another way, the overreaction and underreaction offer a chance to profit by buying stocks at a bargain. Value investing proponents are not limited to quantitative but also extends to qualitative parameter. Value investing is a long-term investment strategy for which investors need to be patient and trust the fundamentals of the company. The market is a mix of value investors, noise traders, trend chasers, day traders, etc. If all the investors had the same characteristics, the market would have been very stable and predictable. In reality, every human is unique in terms of his or her investment needs, emotions (patience, greed, fear, etc.), and amount involved. Investors need to overcome emotions in order to be successful value investors; patience is one such key to the success of this long-term strategy.

In the present paper, authors attempt to judge the familiarity of Indian investors with the concept of value investing using three indicators: “the low price to book value ratio, the low price to earning ratio and high dividend payout ratio” by analysing the views of 242 respondents using simple aggregates and percentages, mean scores and Levene’s t-test. Hence, this paper helps in answering following research questions:

1. Whether value investing exist in India?
2. Whether Indian investors actually understand and practice value investing? And
3. Whether significant difference is there between males and females as regards to value investing?

After introducing the subject field, rest of the paper has been divided into ‘seven’ Sections. Section 2 presents reviews of the available literature; objectives and hypotheses are given in Section 3 and Section 4 respectively. The methodology is presented in Section 5. Empirical analysis is disclosed in Section 6, followed by conclusion and recommendations in Section 7. Finally, limitations and scope for further research have been given in Section 8.

LITERATURE REVIEW

The authors of the study [1] aimed to build on previously experienced value anomalies by looking at both basic value strategies and complex multi-dimensional value strategies that include momentum components and

capital return variables (Consistent Earning Strategy and Recognized Value Strategy, respectively). It has been demonstrated that these “enhanced” value strategies may outperform the market overall or “simple” value strategies by a significant margin. According to the study [2], value investment strategies that use publicly available data on value investors’ stock holdings to build their portfolios have outperformed broad market indexes in terms of improved long-term investment outcomes.

Researchers in [3] created a straightforward heuristic for quantitative value investing metrics based on stability, profitability, and bankruptcy risk to guarantee the choice of quality companies for a portfolio. Value investing based on algorithms (or heuristics) is encouraged by the authors’ application of the developed model to the “S&P/TSX 60” group of companies of the Toronto stock exchange [4], which led them to conclude that the constructed portfolio based on stocks selected based on the heuristics model proved to be value stocks. The authors [5], evaluated how well the heuristic avoided financially troubled organizations. According to the authors, if the heuristic is successful, it should be able to reject 100% of stocks that subsequently face financial difficulties in addition to choosing shares of respectable companies. Authors [6], analysed Warren Buffett’s extraordinary success (also known as Buffett’s alpha) from a behavioral perspective, attributing it to a combination of good fortune and qualitative and psychological factors, including patience, avoiding overconfidence, organizational culture, and reputation effects, in addition to fundamental factors like the strategic acquisition of safe, high-quality, and inexpensive stocks. The authors [7], came to the conclusion that if investors in fundamental (“value”) investment funds are more patient than investors in other funds, then markets are stable. While trend chasers and noise traders enjoy the luxury of impatience, value investors must exercise patience to counteract market volatility and prevent crashes, as they may exacerbate the impact.

In the literature, value investment and growth investing have been argued; which is better and why? In response, research [8] found that value companies outperform growth stocks, even in times of economic

weakness. Even throughout financial crises like the 1990s, 2008, and others, it is clear that value investors have outperformed growth investors. Due to behavioral factors, value investing produced superior returns despite being less risky, which runs counter to the widely held notion that only high risk may result in higher returns. Furthermore, research [9] revealed that value companies outperformed growth stocks, even when they fell short of the desired “earnings expectations.” This is because of the offsetting of prior overreaction and mispricing. Parallel to that, three factors (biological basis, investor hedging needs, and prior experiences) that describe an individual’s investment strategy—particularly value vs. growth—were highlighted by the authors in [10]. According to a study [11], value premium and market feelings are positively correlated. This means that value investing does better when the market exhibits strong (optimistic or positive) sentiments, or vice versa.

Interestingly, authors in [12] came to the conclusion that the ‘value premium’ exists within a sector regardless of its orientation toward value growth. Further, [13] explained how the greater relative reductions in value-equities might be interpreted as an acceptable response to the eruption of the pandemic shutdown. Finally, after reviewing the literature, [14] concluded that none of the contributions take into account qualitative research on a company to ascertain whether or not the organization has a durable competitive advantage.

OBJECTIVES

The primary intent of the research is to test the familiarity of Indian investors with respect to value investing. Specific objectives are as follows:

1. To determine whether value investing exists in Indian stock market;
2. To check the inclination of Indian investors towards stocks having low price to book ratio;
3. To investigate whether investors buy low PE stocks;
4. To ascertain if Indian investors are concerned with stocks yielding high dividend payout ratio; and
5. To identify difference between males and females with respect to value investing strategies.

HYPOTHESES FORMULATION

The following hypotheses have been developed based on said objectives:

H_{01V} : Value investing does not exist in Indian stock market;

H_{02V} : Indian investor’s do not prefer stocks with low P/B ratio;

H_{03V} : Indian investor’s do not buy low P/E stocks;

H_{04V} : Investors in India are not concerned with high dividend payout ratio; and

H_{05V} : Males and females are not significantly different in practicing strategies of value investing.

RESEARCH METHODOLOGY

To understand the familiarity of individual investor with regards to value investing, a structured questionnaire using Likert’s five-point scale was prepared. The formulated scale was reflective in nature. Non-probabilistic sampling techniques have been used to collect data, specifically snowball sampling and convenient sampling. The final dataset was constituted of 242 responses received from demographically diversified Indian individual investors collected through Google Forms or physical copies as per the case may be. Microsoft Excel worksheets and SPSS have been used to analyse the data. Empirical analysis was done on the collected data of 242 respondents in three parts: firstly, by analysing their responses in percentage of agreement or disagreement with the statements; secondly, by analysing the means score and standard deviation for each statement; and lastly, to find out if there is any significant statistical difference in the responses of males and females towards the statements using Levene’s t-test.

EMPIRICAL ANALYSIS

The primary data collected using questionnaire have been analysed using three statistical measures that is aggregative and percentages, mean score and Levene’s T test which is discussed in following sub sections:

Analysis of Responses

Table 1 outlines the responses received from 242 individual stock market investors in India for each of the 3 statements examining value investing behaviour of Indian investors.

Table 1: Analysis of respondent's response for each scale item (In Numbers and Percentage)

“Statements”	“Strongly Agree”		“Agree”		“Neutral”		“Disagree”		“Strongly Disagree”	
	Count	%	Count	%	Count	%	Count	%	Count	%
I prefer to buy stocks with low price to book value ratio.	42	17.36	117	48.35	53	21.90	23	9.50	7	2.89
I prefer to buy stocks with low PE ratio.	28	11.57	97	40.08	86	35.54	22	9.09	9	3.72
I like to invest in stocks with High Dividend pay-out ratio.	29	11.98	94	38.84	98	40.50	12	4.96	9	3.72

Findings of Table 1 are interpreted as below. For better understanding, responses in the same direction are combined together, such as strongly agree with agree and strongly disagree with disagree, to give a straight conclusion as to the respondent's agreement with each statement, whether they accept, reject, or are neutral about the same.

- Low price to book value: When individuals were asked if they liked to buy stocks with a low price to book value, more than three-fifths (63.70%) agreed, whereas slightly more than one-fifth (21.90%) of respondents were not sure or neutral about the same. Also, around one-tenth (12.40%) explicitly rejected buying stocks with a low price to book value ratio.
- Low PE ratio: Surprisingly, only around one-half (51.65%) of the sample individuals agreed to follow the most common belief of the stock market for value investing, i.e., to buy stocks with a low PE ratio. More than one-third (35.54%) were neutral about the PE ratio, while around one-tenth (12.81%) were against purchasing the stocks with low PE as they represent cheap stocks.
- High dividend pay-out: When individuals were asked if they go for companies paying high dividends, around one-half (50.83%) were in favour of such companies, whereas almost two-fifths (40.50%) were neutral about the same.

Analysis by Mean Scores

The means scores and standard deviation for each scale

item are summarized in Table 2.

Table 2: Mean Score and Standard Deviation of each Item- Value Investing

“Item Statistics”			
‘Statements’	‘Mean’	‘Std. Deviation’	‘Coefficient of Variation’
I prefer to buy stocks with low price to book value ratio.	3.678	0.9659	0.263
I prefer to buy stocks with low PE ratio.	3.467	0.9428	0.272
I like to invest in stocks with High Dividend pay-out ratio.	3.504	0.9030	0.258

Table 2 summarizes the mean scores, standard deviation, and coefficient of variation of three items representing value investing, i.e., “a low P/B ratio, a low P/E ratio, and a high dividend payout ratio.” The highest mean score of 3.678 is attributed to the investors preference to buy stocks with a low price-to-book ratio that confirms the existence of a sufficient margin of safety, that is, a purchase price less than the book value (used as a proxy for intrinsic value), followed by the investors likelihood to buy high dividend-paying stocks and low PE stocks with an average of 3.504 and 3.467, respectively. Analysing the standard deviation and coefficient of

variation, the least variance was observed between respondent's preferences to invest in stocks with a high dividend payout ratio, with a 0.258 coefficient of variation. It can be concluded that hypotheses 2, 3, and

4 are rejected, and Indian investors prefer to buy stocks with a low PE ratio, a low PB ratio, and a high dividend payout ratio, representing value stocks.

Table 3: Summary Item Statistics- Value Investing

"Summary Item Statistics"							
	"Mean"	"Minimum"	"Maximum"	"Range"	"Maximum / Minimum"	"Variance"	"N of Items"
Item Means	3.550	3.467	3.678	.211	1.061	.013	3
Inter-Item Correlations	.513	.429	.576	.147	1.342	.005	3

Further, calculating the grand mean of value investing construct as 3.55, it can be concluded that value investing exists in Indian stock market.

Test of Independent Samples

For each of the three item scale data, the independent samples t-test was used to see if the mean values of the male and female responses differed statistically significantly. The results are summarized in Table 4.

The statistical values for each of the three propositions are shown in Table 4 for the two scenarios where equal

variances are assumed and not assumed, respectively. The values of a row with equal variances are taken into account for practical purposes. P values (shown in the Sig. column) have been used as the deciding criteria for this study at the .05 level of significance.

Consequently, if the P value is less than 0.05, there is a statistically significant difference between the two variables. These findings suggest that there is no statistically significant difference between the responses of men and women to any of the three assertions in Table 4. Hence, hypothesis 5 cannot be rejected.

Table 4: Independent Sample T-test results- Value Investing

"Independent Samples Test"										
		"Levene's Test for Equality of Variances"		"t-test for Equality of Means"						
		'F'	'Sig.'	't'	'df'	'Sig. 2-tailed'	'Mean Difference'	'Std. Error Difference'	'95% Confidence Interval of the Difference'	
									Lower	Upper
I prefer to buy stocks with low price to book value ratio.	Equal variances assumed	.488	.486	.736	240	.463	.0924	.1255	-.1549	.3397
	Equal variances not assumed			.745	231.344	.457	.0924	.1239	-.1518	.3366

I prefer to buy stocks with low PE ratio.	Equal variances assumed	4.277	.040	.628	240	.531	.0769	.1226	-.1646	.3184
	Equal variances not assumed			.644	237.527	.520	.0769	.1195	-.1585	.3124
I like to invest in stocks with High Dividend pay-out ratio.	Equal variances assumed	.918	.339	-1.524	240	.129	-.1782	.1169	-.4086	.0521
	Equal variances not assumed			-1.549	233.224	.123	-.1782	.1151	-.4049	.0485

Table 5: Mean scores for Males and Females - Value Investing.

Group Statistics					
	"Gender"	"N"	"Mean"	"Std. Deviation"	"Std. Error Mean"
I prefer to buy stocks with low price to book value ratio.	Male	138	3.717	1.0036	0.0854
	Female	104	3.625	0.9157	0.0898
I prefer to buy stocks with low PE ratio.	Male	138	3.500	1.0127	0.0862
	Female	104	3.423	0.8441	0.0828
I like to invest in stocks with High Dividend pay-out ratio.	Male	138	3.428	0.9428	0.0803
	Female	104	3.606	0.8409	0.0825

After Table 4, Table 5 further demonstrates the direction in which males and females differ, though insignificantly: in the first and second statements, the mean scores for males exceed the mean scores for females. Therefore, although there is an insignificant statistical difference, males, being bold and risk takers, are more likely to follow a contrarian investing strategy.

CONCLUSION AND RECOMMENDATIONS

In this paper, an attempt is made to examine the existence of value investing in the Indian stock market. For this purpose, primary information has been collected from 242 respondents including 138 males and 104 females and analysis is done using simple aggregative, mean score and Levene's T test. Simple value investing strategies namely "low price-to-book ratio, low price-

to-earnings ratio, and high dividend payout ratio" have been specifically examined. Further, difference between perception of males and females towards value investing is also analysed.

Findings suggest that more than three-fifths (63.70%) of the respondents prefer to invest in low price to book value stocks. Also, more than one-half (51.65%) of the investors showed interest in stocks with low PE ratio. Approximately, equal number of respondents that is more than one-half (50.83%) of the respondents also value stocks yielding high dividend payout ratio. In terms of mean score, each scale item has a mean value of more than 3 and overall grand mean comes out to be 3.55, confirming the existence of value investing in Indian stock market. Levene's T test further suggests that there is no statistically significant difference between males and females. Thus, it can be concluded

that investors acknowledge value investing strategies in Indian stock market.

Still financial literacy programmes by government and educational institutions are recommended to educate and enlighten more and more investors to pursue value investing. Moreover, in general, paper on the basis of reviewed literature, suggests to learn to be patient as patience is the key to value investing.

LIMITATIONS & SCOPE FOR FUTURE RESEARCH

This study is subject to some limitations because it is impossible to conduct a perfect study. The current study's analysis is limited to the use of primary data collected with the help of structured questionnaire, and no secondary data is used. To measure the familiarity of Indian investors with value investing, only three fundamentals have been used namely, "low price to book ratio, low price to earnings ratio and high dividend payout ratio." To collect data, convenient and snowball sampling is used; hence, the demographic profile of respondents is not as diversified as a random sampling can offer. Respondents from Delhi are selected as a representative of India. Lastly, sample size of the study is not very large. These restrictions, in our assessment, do not materially impair the work's usefulness. Despite these flaws, it largely accomplishes the goal of the study.

Considering the limitations discussed in the present study, future researchers can opt to develop a more comprehensive model to investors familiarity with value investing. For such analysis, secondary data can also be used in terms of trading records, search history, profitability, etc. Also, responses can be collected from various other states, and a similar analysis can be made with a larger sample.

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Exploring the Shift from Annual to Continuous Performance Review

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ABSTRACT

Performance reviews have traditionally been central to organizational management, conducted annually to evaluate employee performance, set future goals, and plan remuneration. However, evolving work environments, influenced by technological advancements and shifting workforce expectations, have exposed significant shortcomings in traditional annual reviews. These include infrequent feedback, lack of timely development opportunities, and employee anxiety during assessment periods. Continuous Performance Reviews (CPR) have emerged as a viable alternative, emphasizing ongoing dialogue and real-time feedback. This paper presents a bibliometric analysis of literature related to the transition from annual to continuous performance reviews. Key trends, prominent authors, influential journals, and the impact of this paradigm shift on performance management practices are identified. The findings provide valuable insights for organizations seeking to improve their performance management systems and address the evolving needs of their workforce.

INTRODUCTION

Performance reviews have undergone significant evolution, reflecting changes in organizational practices and workforce dynamics. Historically, during the industrial age, standardized metrics were used for periodic evaluations, primarily conducted annually. While these reviews provided a structured approach, they often lacked flexibility and responsiveness to individual employee needs. Traditional appraisal systems failed to deliver timely feedback and offered limited development opportunities. Research by Pulakos et al. (2015) revealed that [1] only 29% of employees found annual appraisals useful, underscoring their inadequacy and misalignment with employee expectations.

The growing demand for more agile and employee-centric practices has led to the emergence of Continuous Performance Reviews (CPR). Unlike annual reviews, CPR emphasizes real-time feedback, continuous dialogue, and adaptability to dynamic organizational goals. This paper explores the shift from annual to continuous performance reviews, analyzing its implications for performance management and organizational success.

LITERATURE REVIEW

Historical Perspective on Performance Reviews

Performance reviews have long been a cornerstone of organizational management. Initially designed for administrative purposes, these reviews evolved to include developmental goals and employee performance assessments. However, the annual nature of these reviews limited their effectiveness in addressing real-time challenges and fostering employee engagement.

Limitations of Traditional Annual Reviews

Annual performance reviews are criticized for several shortcomings:

- **Infrequent Feedback:** The annual format fails to address issues in real time, delaying corrective actions and developmental opportunities.
- **Employee Anxiety:** The anticipation of annual reviews often induces stress and apprehension among employees.
- **Lack of Development Focus:** Traditional reviews prioritize evaluation over development, hindering continuous improvement.

Emergence of Continuous Performance Reviews

CPR represents a significant departure from traditional practices by introducing frequent feedback, ongoing goal alignment, and a focus on employee development. CPR fosters a culture of continuous improvement and aligns individual performance with organizational objectives. Modern organizations increasingly adopt CPR to address the limitations of annual reviews and meet the demands of dynamic work environments.

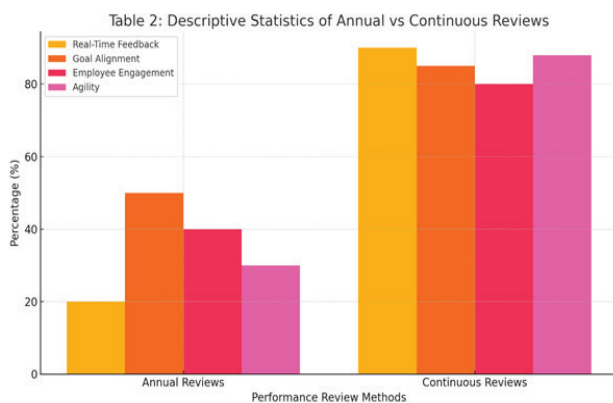
METHODOLOGY

This study employs a bibliometric analysis to examine the transition from annual to continuous performance reviews. Relevant literature was collected from leading academic databases, focusing on publications from the past decade. Key trends, influential authors, prominent journals, and recurring themes were identified and analyzed.

Key Findings

Growth in CPR Research

The analysis revealed a steady increase in research on CPR, reflecting its growing importance in performance management practices. Studies highlight the benefits of real-time feedback, employee engagement, and adaptability.



Influential Authors and Journals

Prominent contributors to CPR research include Pulakos, Aguinis, and Buckingham, whose work has shaped the [1,2,3] understanding of modern performance management practices. Leading journals, such as the Journal of Applied Psychology and Harvard Business Review, have published impactful studies on this topic.

Impact on Organizational Practices

CPR adoption has been shown to:

- **Enhance Employee Engagement:** Frequent interactions foster a sense of inclusion and motivation.
- **Improve Goal Alignment:** Real-time feedback ensures alignment between individual and organizational objectives.
- **Foster Continuous Development:** Ongoing dialogue promotes skill enhancement and career growth.

Employee-Centric Approaches

Modern performance management emphasizes employee-centric strategies, focusing on individual growth, motivation, and engagement. CPR supports these strategies by fostering personalized development plans and recognizing employee contributions in real time.

Technology Integration

The role of technology in facilitating CPR is paramount. Performance management software and analytics enable organizations to track progress, provide real-time feedback, and ensure transparency. Tools like AI-driven feedback systems and digital platforms have made CPR implementation more efficient and scalable.

Managerial Training

The effectiveness of CPR relies heavily on managerial capabilities. Training programs for managers on delivering constructive feedback, setting clear goals, and fostering open communication are essential for successful CPR adoption.

Feedback-Driven Culture

Creating a culture that values feedback is crucial for CPR success. Organizations must encourage open communication, trust, and collaboration, ensuring that feedback is viewed as a tool for growth rather than criticism.

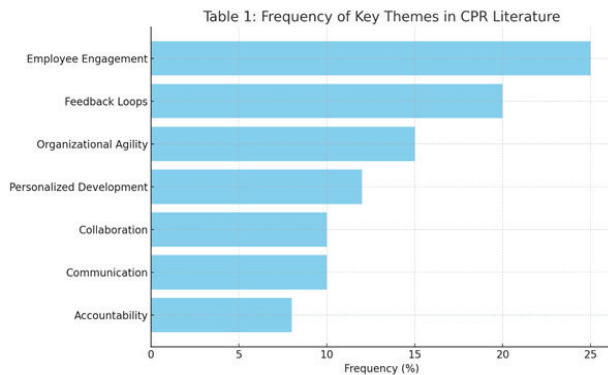
Organizational Agility

In rapidly changing work environments, agility is key. CPR enables organizations to adapt quickly by aligning employee performance with shifting

priorities and market demands, fostering resilience and competitiveness.

Employee Motivation and Engagement

Frequent recognition and feedback under CPR enhance employee motivation and engagement. By addressing individual aspirations and concerns, CPR creates a supportive environment that drives productivity and satisfaction.



Challenges and Solutions

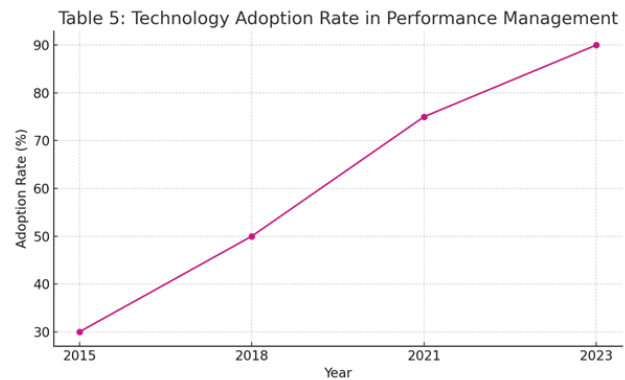
Implementing CPR is not without challenges. Resistance to change, lack of managerial skills, and technological limitations can hinder adoption. Organizations must address these issues through change management strategies, comprehensive training programs, and investments in robust technological infrastructure.

Practical Implications

Organizations aiming to implement CPR should consider the following:

- **Integrating Technology:** Utilize performance management software to facilitate real-time feedback and data tracking.
- **Training Managers:** Equip managers with the skills to provide constructive feedback and support employee development.
- **Cultivating a Feedback-Driven Culture:** Encourage open communication and collaboration across all levels of the organization.
- **Aligning Goals:** Ensure that individual performance aligns with organizational objectives through regular updates and adjustments.

- **Measuring Impact:** Continuously evaluate the effectiveness of CPR systems using performance metrics and employee feedback.



CONCLUSION

The shift from annual to continuous performance reviews marks a significant advancement in performance management practices. CPR addresses the limitations of traditional appraisals by fostering real-time feedback, enhancing employee engagement, and promoting continuous development. This research highlights the growing importance of CPR in modern workplaces and provides practical recommendations for organizations seeking to adopt this transformative approach. By embracing CPR, organizations can improve performance management systems, align with evolving workforce expectations, and achieve sustained growth.

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Integrating Circular Economy in Waste Management: Strategies and Industrial Cases in India

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ABSTRACT

The circular economy (CE) emphasizes waste reduction, resource efficiency, and recycling, with various recycling technologies playing a vital role in fostering this sustainable transition. This paper investigates the integration of Circular Economy (CE) principles into India's waste management practices, emphasizing the pivotal role of small and medium-sized enterprises (SMEs) in advancing innovative waste reduction strategies. The study examines key regulations, such as the Solid Waste Management Rules, 2016, and the Plastic Waste Management Rules, while addressing persistent issues like inadequate infrastructure, unsorted waste, and societal stigma surrounding waste management. Through cases of leading SMEs -Sulochana Cotton Spinning Mills in textiles, Attero Recycling in electronics, and Carbon Masters in organic waste recycling - the research demonstrates how effective CE strategies can transform waste into valuable resources and contribute to environmental sustainability. The findings reveal that these initiatives enhance resource efficiency and promote economic resilience by improving recycling practices and resource recovery. The paper highlights critical research gaps, including the necessity for longitudinal studies and the exploration of technological barriers that SMEs encounter.

KEYWORDS: Circular economy, India, Waste management, Small and medium enterprises (SMEs), Sustainable development.

INTRODUCTION

The rapid urbanization and industrialization of India has led to a large increase in the amount of waste produced which creates serious problems for traditional waste management systems. The predominant linear model of “take, make, dispose” is considered unsustainable as it results in the destruction of the environment and affects resource availability. Circular economy (CE) addresses these concerns with its holistic framework, that minimizes waste, enhances resource efficiency, and promotes recycling [1]. Practical transition towards a circular economic development focuses on efficient resource and waste management,

and the process is also important in protecting the environment from degradation. New technologies are helpful in enhancing the systems of managing waste and their performance [2]. This paper explores the ways of integrating principles of CE into the practices of managing waste in India while focusing on the role of recycling technologies. It also showcases the critical role that Indian SMEs play in driving circular innovations, using industrial case-based studies from sectors such as textiles, electronics, and energy.

The concept of the circular economy is a transformative strategy designed to address imminent problems of resource depletion, environmental degradation, and

unsustainable consumer behaviors [2]. CE focuses on minimizing waste by relying on renewable energy sources, optimizing resource use, and implementing sustainable production and consumption strategies [3]. Studies have shown that the practices of CE have made significant impacts across industries, by enhancing resource efficiency, reducing waste, and fostering innovation. Adoption of circular principles will enable the industries to reform into a sustainable as well as resilient economy while simultaneously generating economic value and reducing environmental harm [4]. Sustainable development means not only to decrease the material use in design phase but to also use and implementing efficient material recycling systems [5]. Various recycling technologies are crucial in this regard, including primary recycling, secondary or mechanical recycling, tertiary or chemical recycling and quaternary recycling [6].

In primary recycling, the post-consumer waste is reintegrated into the manufacturing process and no new materials are used to produce the same product. It is an approach to waste management which has advantages especially in plastics, as it is more efficient in terms of energy and other resources. In mechanical recycling processes, plastic wastes are recovered by converting them into a new product, thereby reducing reliance upon virgin material. Tertiary recycling involves breaking down plastics into their basic chemicals which can be used in other different products. Further, applied to the biorefining process for developing bio-based products from organic wastes such as bioplastics and biofuel. Included under the categories of chemical recycling are; depolymerization, gasification, pyrolysis, hydrocracking etc. [7]. In quaternary recycling, waste is thermally treated by combustion in order to generate energy. This exploits the high calorific value of the constituents of waste for heating purposes or to produce electric power [8]. Utilization of these recycling technologies will help India to strengthen its circular waste management strategies, reduce reliance on raw materials, and foster environmental sustainability.

CURRENT WASTE MANAGEMENT PRACTICES IN INDIA

India has seen a changing face in terms of waste management, which forms a significant challenge

along the lines of industrial development and rapid urbanization. The current population is more than 1.4 billion people in the country. It is estimated that over 62 million tons of municipal solid waste are generated every year, of which about 70% is treated either through landfilling or is left disposed of in some open spaces which poses risks to the health of human as well as environment. [9]. The old style of resource management through the “take, make, dispose” linear model has proved defective in as much as they lead to resource depletion and pollution. The Indian government has taken some steps aimed at promoting sustainability to mitigate the problems faced in waste management. The Solid Waste Management Rules of 2016 strictly enforce the segregation of waste at source into three categories: dry, wet, and hazardous. This initiative aims to stop the landfill dumping by encouraging recycling and composting. However, its effectiveness is hindered by poor enforcement and public compliance, with only about 20% of Indian cities practicing effective waste segregation [10]. Additionally, the Plastic Waste Management Rules impose stricter regulations on plastic usage, including a ban on carry bags made from plastic thinner than 120 microns, and initiatives like on-site sterilization of biomedical waste seek to mitigate environmental damage [11]. Despite these regulatory efforts, India’s waste management system faces significant challenges, including ineffective waste segregation, social and cultural barriers to public participation, inadequate infrastructure, and reliance on the informal sector for waste collection [12];[13]. However, progress is evident in integrating circular economy principles. Decentralized waste management models, such as Pune’s SWaCH cooperative which employs waste pickers to enhance local recycling efforts. The Extended Producer Responsibility (EPR) framework also mandates producers to manage their products’ end-of-life, especially in electronics and packaging [1]. Even though the policy reforms and localized initiatives show promise, addressing the underlying challenges needs urgent attention to make waste management practices sustainable in India.

To advance towards a circular economy (CE), India’s priority lies in embracing several key strategies aimed at enhancing resource efficiency, waste reduction, and sustainability. Some of the major strategies being implemented are:

Advanced Material Recovery

India is emphasizing on developing material recovery systems to enhance the value gained from secondary resources. This involves employing cutting-edge technologies such as mechanical recycling, pyrolysis, and robotics to enhance the sorting, separation, and recycling processes. These technologies reduce environmental impact by diverting waste from landfills and also optimize resource recovery, ensuring that materials are reused efficiently. These technologies help to improve the effectiveness and efficiency of waste management, enables recovery of materials at a higher quality.

Localized Recycling Hubs

Another strategy India is employing is the establishment of localized recycling hubs. These hubs are community-based facilities that enable individuals to bring, sort, and dispose various types of waste. Research shows that recycling rates are significantly higher in areas where recycling hubs are easily accessible, leading to a substantial reduction in waste generation [14]. By making recycling more convenient and localized, these hubs can encourage more widespread public participation, which in turn leads to greater material recovery and reduced environmental degradation [12].

Incentivizing SMEs

The role of SMEs is integral in promotion and adoption of circular economy practices. The Indian government is supporting SMEs by offering various incentives to encourage sustainable practices, including the use of technologies for recycling of waste. For example, Small Industries Development Bank of India (SIDBI) had introduced MSE SPICE scheme to incentivize the adoption of circular economic practices, thereby fostering resource-efficient and sustainable business models [15]. These incentives provide financial and regulatory support to SMEs, enabling them to integrate CE principles into their operations and contribute to a broader transition towards a circular economy.

By focusing on these strategies, India is laying the groundwork to transition towards the goal of sustainability and resource-efficiency. These efforts are critical in addressing the challenges posed by waste

management and promoting the long-term vision of a circular economy.

CASE BASED STUDIES ON SMES DRIVING CIRCULAR ECONOMY IN INDIA

Textiles and Apparel Industry (Sulochana Cotton Spinning Mills)

Sulochana Cotton Spinning Mills, located in Tamil Nadu, has innovatively transformed used PET bottles into fabrics and garments. The recycling process begins with washing and breaking down the PET bottles into flakes, which are then melted down. The molten polymer is extruded through fine nozzles to create fibres. These synthetic fibres are blended with natural fibres to produce yarns and garments.

The company's primary aim is to establish an effective recycling system for PET bottles, which take 500 to 1,000 years to degrade which reflects their dedication towards minimization of environmental hazards through sustainable practices. Notably, around one-third of the plant's area is dedicated to vegetation, which supports a diverse range of bird species [5]. Despite their progress, the company faces challenges such as higher production costs. Garments made from recycled materials are often pricier than those made from virgin materials, primarily due to the energy-intensive manufacturing processes. Additionally, the lack of a comprehensive waste management system limits the availability of PET bottles, resulting in many bottles ending up in landfills. Sulochana Cotton Spinning Mills recycles over 7 million PET bottles daily, with approximately 20 to 40 bottles required to create a single garment. This significantly reduces the environmental harm caused by discarded bottles. Furthermore, their manufacturing process is remarkably water-efficient, utilizing almost no water, thus contributing to a reduction in PET bottle waste in the long term.

This case demonstrates the potential of recycling PET bottles into garments. By inspiring other textile industries to adopt similar recycling practices, there is a significant opportunity to reduce waste generation across the sector while benefitting the environment.

Electronic Waste Recycling (Attero Recycling)

Founded in 2008 in Noida, Attero Recycling specializes in recycling electronic waste (e-waste). They employ chemical recycling technologies to recover precious metals such as gold, silver, aluminum, and copper from discarded electronics.

Attero leverages advanced technologies to enhance operational efficiency, employing mechanical recycling, pure metallurgical methodologies, and hydrochemical processes for batteries. These techniques improve productivity and scalability while maintaining sustainable practices throughout their operations [4]. The e-waste sector faces significant challenges, particularly concerning the harmful waste produced at the end of a product's lifecycle. Additionally, issues related to the environmental and social impacts of raw material extraction for electric vehicle (EV) batteries pose considerable obstacles, as about 50% of an EV's cost is tied to its battery. Since its inception, Attero has collected and safely disposed of e-waste from over 1,400 cities in India. Partnerships with companies like LG, Samsung, and Hyundai have expanded their reach. They have recycled more than 100,000 tonnes of lithium-ion batteries and are developing processes specifically for recycling these batteries.

Attero's innovative approach illustrates the effective recycling of e-waste, generating valuable materials while mitigating environmental harm. As the EV market expands, Attero's methods provide a sustainable solution for battery recycling, addressing the increasing challenge of e-waste.

Organic Waste Recycling (Carbon Masters)

Established in 2012 in Bengaluru, Carbon Masters focuses on converting organic waste into useful fuel. Their bio-CNG trucks collect organic waste from various locations in Bengaluru, which is then treated anaerobically to produce methane gas and organic slurry. The purified gas is bottled as Carbonlite, a climate-friendly alternative to fossil fuels, while the remaining organic slurry is processed into organic manure [7].

Carbon Masters aims to reduce organic waste by converting it into eco-friendly products. Carbonlite serves as an excellent alternative to fossil fuels, and the organic fertilizers produced are beneficial for crops and

safe for human health. Skepticism surrounding biogas usage remains a significant barrier in India, as many people prefer fossil fuels. Moreover, sourcing organic waste can be challenging due to unsorted waste disposal systems. Carbon Masters has successfully recycled over 35 tonnes of organic waste daily, producing over 1,000 kg of bio-CNG and 10 tonnes of organic fertilizers. They plan to expand operations to other Indian states. According to the World Wildlife Fund (WWF), if replicated globally, their technology could potentially reduce 28.6 million tonnes of greenhouse gas emissions by 2027.

Carbon Masters demonstrates how organic waste can be transformed into valuable resources like fuel. Their product, Carbonlite, provides an eco-friendly alternative to fossil fuels, while their organic fertilizers offer a safer and healthier option compared to chemical fertilizers.

DISCUSSION & CONCLUSION

Despite the promising insights gained from the case studies of SMEs in the textiles, electronics, and organic waste sectors, several lacunas can be spotted in the CE practices of India's waste management. Longitudinal studies enable assessment of the long-term economic impacts of CE adoption on SMEs, particularly regarding their financial viability, operational efficiencies, and market competitiveness. Comprehensive research could provide a clear understanding of the impact of these practices on the business sustainability across different industries. Second, further analysis into the scalability and replicability of localized recycling hubs as these case studies reveal needs to be pursued. Research should examine the socio-economic and geographical factors that contribute to the success of these hubs and how they can be effectively implemented in varying contexts. The third research gap, that is, regarding community engagement and behavior change for recycling practices, is very limited. Understanding the social dynamics that drive public participation in waste management initiatives will increase the impact of circular practices. Also, the potential of technology in transition into CE is another area that requires more focused research. The case studies emphasize the use of innovative recycling technologies, while few studies have been conducted on the barriers and facilitators for SME adoption of such technologies. Finally, critical

analysis of the environmental impact of CE practices is required, such as carbon footprint reduction and resource conservation, in order to validate ecological benefits allegedly delivered through such initiatives.

The present study demonstrates the pivotal role of SMEs in India toward initiating circular economy practices within waste management through case studies on recycling in textiles, electronics, and organic waste. Results are clearly evident to show that innovative practices will increase resource efficiency and bring about sustainable development. But the research gaps must be filled to further enhance the implementation of these initiatives. The formulation of a successful policy would require comprehensive longitudinal studies, scalability assessments of localized recycling hubs, and enhanced community engagement. The principles of Circular Economy would thus be advocated through joint efforts between policymakers, businesses, and communities in ascertaining a sustainable waste management path, thereby fostering economic resilience in India.

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Circular Economy and Women's Financial Resilience: Understanding the Interconnections

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ABSTRACT

This research paper investigates the interrelationship between the circular economy (CE) and women's financial resilience, focusing on how circular practices can contribute to reducing the gender wealth gap. As the global economy shifts from a traditional linear model to a more sustainable approach that emphasizes reuse, repair, and recycling, the potential for creating economic opportunities for marginalized groups, especially women, has become increasingly apparent. This study draws on secondary data and existing literature to highlight the unique challenges women face in achieving financial stability and how the CE can address these issues through local job creation, sustainable business models, and diversified income sources. Key circular practices such as upcycling, repair services, and sharing economies are examined for their role in enhancing women's financial independence. By providing real-world examples and case studies, the paper illustrates how circular economy initiatives not only empower women economically but also promote sustainable development. The findings underscore the importance of targeted policies and collaborative efforts from stakeholders to support women's participation in the circular economy, ultimately contributing to greater economic equity and resilience.

KEYWORDS: *Circular economy, Women's financial resilience, Recycling, Upcycling, Waste management, Sustainable practices, Sustainable development.*

INTRODUCTION

The circular economy (CE) represents a transformative shift away from the traditional linear economic model of "take, make, dispose" towards a system that promotes the sustainable use of resources by emphasizing reuse, repair, and recycling. [1]. This economic framework has garnered increasing attention as a means to address environmental challenges, reduce resource scarcity, and generate economic opportunities. However, the implications of the circular economy extend beyond environmental sustainability, offering potential pathways for fostering financial resilience among marginalized groups, including women.[2]. Financial resilience, broadly defined as the ability of individuals to withstand financial shocks and recover from economic setbacks, is critical for women, who often face gender-specific challenges in achieving long-term economic stability. [3]

Women's financial resilience is influenced by numerous factors, including access to economic resources, social support systems, and opportunities for income diversification [4]. Despite advancements in gender equality, women worldwide continue to experience economic disparities, particularly in terms of wealth accumulation and financial security. [5]. The circular economy offers a unique approach to mitigating these issues, as it can foster local job creation, support sustainable business models, and enable inclusive economic growth that benefits women. [6]. In particular, circular practices such as upcycling, repair services, and sharing economies create opportunities for women to engage in income-generating activities that can bolster their financial independence. [7]

This paper aims to explore the interconnections between the circular economy and women's financial resilience, drawing on secondary data to examine how

circular practices can contribute to reducing the gender wealth gap. Through a review of existing literature and case studies, this study investigates the potential of the circular economy initiatives to enhance women's financial security, particularly in contexts where traditional economic models have failed to provide equitable opportunities. By understanding these interconnections, policymakers and stakeholders can better support women's economic empowerment in a sustainable and inclusive manner.

LITERATURE REVIEW

A study by Bocken et al. explored the role of product design and business model strategies in promoting the circular economy. The study emphasizes that sustainable business models, such as sharing and service-based economies, can offer new employment opportunities. This aligns with enhancing women's financial resilience by creating inclusive and flexible job opportunities within circular systems. [2]

UN Women reported on how the circular economy can empower women by providing sustainable business opportunities. The report discusses the significant impact of circular initiatives on women in developing regions, where circular activities like recycling and upcycling foster financial independence and resilience. [6]

Hobson and Lynch argue that the circular economy can contribute to social transformation by addressing economic inequalities. The study highlights the potential of the circular economy to provide marginalized groups, including women, with alternative economic opportunities that reinforce financial resilience in resource-scarce environments. [7]

Ghisellini et al. provided a comprehensive review of circular economy practices across different nations, analyzing how these practices impact economic growth and job creation. The authors suggest that circular models contribute to income generation opportunities that particularly benefit women, especially in the informal economy. [8]

Singh et al. focused on the role of upcycling businesses in promoting women's entrepreneurship within the circular economy. The study reveals that such businesses offer income-earning opportunities that help

women build financial resilience while contributing to sustainable practices. [4]

Ellen MacArthur Foundation discussed the principles of the circular economy and its potential to create inclusive growth. The report highlights how circular practices can provide flexible and accessible income sources, which are particularly beneficial to women balancing work and caregiving responsibilities. [1]

A study by OECD examined gender disparities in economic resilience and identifies circular economy initiatives as a means to support social inclusion. The study argues that by participating in circular economy practices, women can diversify their income sources, thereby increasing their ability to withstand financial shocks. [5]

Jaeger-Erben et al. investigated sustainable consumption practices and highlight how circular economy initiatives like repair services and product sharing can reduce economic inequalities. The study underscores that such practices can offer accessible and affordable solutions that enhance women's financial resilience. [9]

Huis and Hansen explored the role of microfinance in enhancing women's financial resilience. Although not solely focused on the circular economy, the study demonstrates how access to the capital can enable women to participate in circular initiatives such as small-scale recycling or upcycling businesses. [3]

Camacho-Otero et al. provided an analysis of consumer participation in circular economy practices and highlight the gendered aspects of these behaviors. The authors suggest that women are more likely to engage in circular practices, which can contribute to their financial independence and resilience through savings and income generation. [10]

RESEARCH GAP

The existing literature on the circular economy (CE) and women's financial resilience reveals several research gaps. While studies provide theoretical insights, empirical evidence on the impact of CE practices on women's financial resilience is scarce. [2][8]. Additionally, there is a lack of context-specific research in countries like India, where understanding localized experiences is crucial. The literature often generalizes

women's experiences without considering variations in socioeconomic and educational backgrounds, and comprehensive frameworks categorizing barriers and enablers are missing. Moreover, longitudinal studies assessing the long-term effects of CE participation on women's financial security are limited. Addressing these gaps is essential for developing a nuanced understanding of how CE can enhance women's financial resilience.

OBJECTIVES

To analyze how circular economy practices contribute to women's financial resilience

To identify the barriers and enablers for women's participation in the circular economy

To evaluate the potential of the circular economy initiatives to reduce the gender wealth gap

RESEARCH METHODOLOGY

The study is based on secondary data gathered from a variety of sources, including journals, research papers, and books. A comprehensive literature review was then conducted to align with the study's objectives and to draw informed conclusions.

DISCUSSIONS/ANALYSIS

Circular Economy Practices that Contribute to Women's Financial Resilience

The circular economy (CE) offers a promising pathway for advancing women's financial resilience by creating opportunities for income generation and economic stability. Unlike traditional linear models, which often lead to resource depletion and unsustainable production cycles, the circular economy emphasizes resource efficiency, waste reduction, and the continual reuse of products and materials[1]. These principles create new avenues for entrepreneurship, job creation, and skills development, which can significantly impact women's financial resilience by providing them with stable and flexible income opportunities. [9]

In India, circular economy practices such as recycling, upcycling, and repair services are gaining traction, with women playing a pivotal role. Women are particularly active in the informal recycling sector, which contributes significantly to the country's waste management system. For instance, in cities like Delhi and Mumbai, women

waste pickers, commonly referred to as rag pickers, are involved in the collection, sorting, and recycling of waste. These women, often organized into cooperatives such as the Stree Mukti Sanghatana in Mumbai, earn a steady income by selling recyclable materials to scrap dealers. Such cooperatives also provide them with training, fair wages, and access to healthcare, which strengthens their financial resilience and improves their quality of life. [11][12]

Upcycling, another circular economy practice, is also contributing to women's financial resilience in India. Numerous women-led enterprises transform discarded materials into valuable products. For example, Rimaged, an upcycling business founded by a woman entrepreneur, collaborates with artisans—many of whom are women—to create bags, home decor items, and accessories from waste materials like fabric and plastic. This initiative not only reduces waste but also offers sustainable livelihoods to women from underprivileged backgrounds. By learning upcycling skills, these women gain financial independence, which enhances their resilience against economic uncertainties. [13]

Repair services in India's circular economy also provide income-generating opportunities for women. In the rural village of Pipra in Bihar, a local women's collective called Kanchan Samoo has established a repair shop for agricultural tools and household items. This initiative has empowered women in the community to earn income while reducing waste by keeping items in use for longer. The women involved in the collective receive training in repair skills, which enhances their employability and builds their technical expertise. This increased capacity allows them to supplement their household income, thus contributing to their financial resilience. [14]

Finally, shared economy models within the circular economy, such as Women on Wheels in Delhi, help women earn livelihoods while promoting sustainable transportation. This initiative trains women to become professional drivers, providing affordable transportation while offering women a means to earn a living. Such initiatives enable women to access income sources that are flexible and socially impactful, which reinforces their financial resilience by diversifying their income streams. [15]

These examples from India illustrate that circular economy practices not only help women secure flexible income opportunities but also contribute to building their skills and resilience against financial challenges. By engaging in circular economy activities, women gain financial autonomy and play a crucial role in advancing sustainable development within their communities.

Table 1: Overview of Women-Driven Circular Economy Initiatives in India

Circular Economy Practice	Organization/ Initiative	Impact
Waste Recycling and Management	Stree Mukti Sanghatana, Mumbai: Women waste pickers recycle waste. [12]	- Supports 3,000+ women. - Recycles 20,000 tons of waste annually. [12]
Upcycling of Textile Waste	Rimagined: Women create products from fabric scraps and plastic. [13]	- 5,000+ kg of waste recycled. - 100+ women employed. [13]
Agricultural Waste Upcycling	Amazon Saheli, Karnataka: Women turn agricultural waste into eco-friendly products. [16]	- Supports 10,000+ women entrepreneurs. - Increases income by 15-20%. [16]
E-Waste Management and Training	Chintan Environmental Research and Action Group, Delhi: Women trained in e-waste management. [17]	- Trained 1,000+ women. - 30% income increase for trained women. [17]
Sustainable Transportation Initiatives	Women on Wheels, Delhi: Women trained as drivers for sustainable transport. [15]	- Trained 500+ women. - Reduces carbon emissions. [15]
Community Composting	SWaCH Pune: Women-led cooperative focuses on composting waste. [18]	- Recycles 50,000+ tons of waste annually. - Supports 3,000+ women. [18]
Eco-Friendly Handicraft Production	SEWA Gujarat: Women make handicrafts from recycled materials. [19]	- Supports 15,000 women artisans. - Generates INR 30 million annually. [19]

BARRIERS AND ENABLERS FOR WOMEN'S PARTICIPATION IN THE CIRCULAR ECONOMY

Women's participation in India's circular economy (CE) faces numerous challenges and supportive factors, impacting their ability to fully engage and benefit financially. Understanding these barriers and enablers is essential to promote inclusive CE practices that can enhance women's financial resilience.

Barriers to Women's Participation in the Circular Economy

One major barrier is limited access to capital and financial resources, which restricts women's ability to start or scale CE-related businesses. Women often struggle to meet stringent collateral requirements for loans, and financial products tailored to their specific needs are scarce. Although initiatives like the Micro Units Development and Refinance Agency (MUDRA) aim to improve credit access, many women remain uninformed or face challenges in securing these resources. [20]. For instance, women artisans in rural Rajasthan find it difficult to obtain financing for upcycling projects due to lack of collateral, which inhibits their economic growth. [21]

Limited training and skill development opportunities present another significant challenge. Many women lack access to technical skills essential for higher-value CE roles, such as repair, recycling, and upcycling. For example, the Chintan Environmental Research and Action Group highlights that women waste pickers in Delhi are largely untrained in advanced recycling techniques, confining them to low-income roles within the informal sector. Rural areas particularly suffer from a lack of accessible training centers, which puts women at a disadvantage compared to their urban counterparts.

Cultural norms and societal expectations also play a substantial role in limiting women's CE participation. Socially imposed gender roles often dictate that women prioritize domestic responsibilities over income-generating activities, reducing their availability for CE work. [22]. In rural Bihar, for instance, women involved in community-based recycling initiatives often face independence.

Additionally, inadequate infrastructure and market access restrict women's ability to expand their businesses within the CE. Many rural entrepreneurs lack access to essential resources like reliable transportation and digital platforms, which hampers their ability to reach larger markets. [23]. Women in Jaipur's Bagru textile community, for example, struggle to sell their upcycled products beyond local markets due to limited connectivity and e-commerce access.

Finally, health and safety concerns present a formidable barrier for women engaged in waste management and recycling. Exposure to hazardous materials without adequate protective equipment leads to significant health risks, which deter women from pursuing or sustaining careers in these sectors. The Self-Employed Women's Association (SEWA) notes that many women waste pickers face chronic health issues due to unsafe working conditions, highlighting the need for better occupational safety measures. [11]

Enablers for Women's Participation in the Circular Economy

Despite these challenges, there are also several key enablers that facilitate women's participation in India's circular economy. Government policies and support programs provide crucial assistance. Initiatives like the Swachh Bharat Mission fund women's self-help groups engaged in solid waste management, offering them a stable income source while contributing to community sustainability. [24]. This government support helps mitigate financial barriers and encourages women's involvement in the CE.

Community-based organizations and cooperatives have also been instrumental in empowering women within the CE. Organizations such as SEWA provide access to micro-loans, training, and market linkages, enabling women to establish and expand their businesses in recycling and upcycling. [19]. By joining cooperatives, women gain collective bargaining power, share resources, and access mentorship, which strengthens their economic security.

Another enabler is training and skill development initiatives tailored to CE practices. NGOs like the Chintan Environmental Research and Action Group offer specialized training workshops for women waste

pickers, teaching them valuable skills like e-waste management and composting. [17]. These programs equip women with the skills needed to move beyond manual labor roles and access higher-value opportunities within the CE.

The rise of digital platforms and e-commerce has further opened up new markets for women entrepreneurs. Platforms like Amazon Saheli provide women-led CE businesses with access to global customers, enhancing their income potential. For example, women artisans from rural Karnataka use Amazon Saheli to sell handmade, upcycled products online, reaching a broader audience and increasing their financial stability. [16]

Finally, support from NGOs and international organizations enables women to overcome many of the aforementioned barriers. Programs by UNDP and UN Women, for example, offer funding and resources that help women build sustainable livelihoods within the CE. [25]. These organizations also provide legal support and mentorship, empowering women to navigate regulatory challenges and expand their businesses sustainably.

THE IMPACT OF CIRCULAR ECONOMY PRACTICES ON WOMEN'S FINANCIAL RESILIENCE

The circular economy (CE) presents significant opportunities for enhancing women's financial resilience in India by providing avenues for sustainable livelihoods and empowering women economically. This section explores various CE practices that can improve women's financial standing, along with real-life examples and an analytical perspective.

Empowering Women through Sustainable Livelihoods

One of the primary impacts of CE practices is the creation of sustainable livelihoods for women. In the CE model, waste is viewed as a resource, leading to innovative recycling and upcycling initiatives that can be undertaken by women. For instance, women in the Self-Employed Women's Association (SEWA) in Gujarat have successfully engaged in recycling plastic waste into usable products like bags and containers. By participating in these initiatives, women not only contribute to environmental sustainability but also

secure stable incomes. This model has empowered women to build financial independence while addressing local waste management issues. [19]

Access to New Markets and Economic Opportunities

CE practices enable women to access new markets and diversify their income sources. By promoting the reuse of materials and products, women can engage in various entrepreneurial activities. For example, women artisans in rural Karnataka have transformed agricultural waste into handcrafted, eco-friendly products. Organizations like Amazon Saheli facilitate their entry into online markets, allowing these artisans to reach customers beyond their local communities. [16]. This access to broader markets enhances their earning potential and financial stability, making them less vulnerable to economic shocks.

Skills Development and Capacity Building

The transition to a circular economy often necessitates the development of new skills, which can directly benefit women. Training programs focused on CE practices, such as waste segregation, upcycling, and sustainable farming, equip women with valuable skills that enhance their employability and entrepreneurship prospects. For instance, Chintan Environmental Research and Action Group conducts training workshops for women waste pickers in Delhi, teaching them about advanced recycling techniques and the economics of waste. [17]. By enhancing their skill sets, these women can engage in higher-value activities within the CE, improving their financial resilience.

Strengthening Community Networks and Support Systems

Participating in CE practices often fosters community collaboration, which can further enhance women's financial resilience. As women come together to engage in recycling or waste management activities, they create support networks that provide not just economic benefits but also emotional and social support. For example, women's self-help groups (SHGs) in various Indian states, such as Kerala and Tamil Nadu, have formed cooperatives focused on waste management and recycling. These groups enable members to share resources, access funding, and negotiate better prices for

their products, leading to improved financial stability for all involved. [22]

Promoting Sustainable Consumption and Responsible Practices

CE practices encourage sustainable consumption, which can indirectly enhance women's financial resilience by reducing household expenses. Women, often being the primary managers of household resources, can benefit from learning how to minimize waste and utilize resources more efficiently. For example, women participating in community composting projects in rural Maharashtra have adopted practices that reduce food waste, thereby lowering household expenses and increasing food security. [11]. This ability to manage resources sustainably contributes to greater financial stability and resilience.

Legal and Policy Support Enhancements

Government initiatives promoting the circular economy often include provisions for women's empowerment. Programs like the Atal Innovation Mission aim to enhance women's participation in innovative CE practices by providing financial assistance, training, and resources. [24]. Such legal and policy support can create an enabling environment for women to thrive economically within the CE framework. For instance, the National Policy for Women emphasizes the need for women's participation in economic activities, including those related to sustainability and CE, which can lead to more targeted interventions that support women's financial resilience. [26]

FINDINGS AND CONCLUSION

Findings

This research paper has delved into the intricate relationship between the circular economy (CE) and women's financial resilience, specifically within the Indian context. Through an analysis of secondary data and case studies, several key findings emerge:

Circular economy practices such as recycling, upcycling, and repair services create diverse income-generating opportunities for women, enabling them to gain financial independence. Women engaged in these initiatives often transition from informal roles to more stable and lucrative positions. For example,

cooperatives like SEWA not only provide women waste pickers with steady incomes but also offer training and healthcare, significantly improving their quality of life.

Digital platforms have opened up new avenues for women to market their products beyond local confines. Women artisans utilizing platforms like Amazon Saheli can reach global customers, enhancing their financial stability and resilience. This access to wider markets is crucial in diversifying income sources, reducing dependency on single income streams.

The shift towards a circular economy necessitates the development of skills that are often lacking among women, particularly in rural areas. Training programs offered by NGOs and government initiatives have shown to be effective in empowering women with necessary skills, allowing them to participate in higher-value roles within the CE. For instance, workshops on advanced recycling techniques have enabled women to engage in more lucrative aspects of waste management.

Participation in CE practices often foster collaboration among women, creating robust support networks. Women's self-help groups (SHGs) act as platforms for resource sharing, capacity building, and financial cooperation, significantly contributing to their economic security. The cooperative model has proven effective in helping women negotiate better prices and access collective funding.

By adopting sustainable practices encouraged by the CE, women can reduce household expenses and improve food security. Initiatives focused on composting and waste reduction not only benefit the environment but also contribute to better financial management within households. This economic empowerment translates into enhanced financial resilience, enabling women to withstand economic shocks.

Government initiatives promoting CE and women's empowerment are essential for creating a conducive environment for women's participation. Policies like the Atal Innovation Mission and the National Policy for Women aim to facilitate women's entry into sustainable economic activities, further underscoring the importance of legal and policy frameworks in supporting women's financial resilience.

Despite the opportunities presented by CE practices, women face several barriers, including limited access to the capital, lack of training, and societal norms that prioritize domestic responsibilities over economic activities. These barriers significantly hinder women's full participation and limit the potential benefits they could derive from engaging in the circular economy.

CONCLUSION

The circular economy presents a viable pathway for enhancing women's financial resilience in India, providing opportunities for economic empowerment, skill development, and access to new markets. However, for women to fully leverage these opportunities, several barriers must be addressed. Policymakers, stakeholders, and NGOs must work collaboratively to create an enabling environment that includes:

- Improved access to financial resources tailored to women's needs.
- Targeted training programs that enhance skills related to CE practices.
- Community support systems that empower women through cooperatives and self-help groups.
- Legal and policy frameworks that specifically promote women's participation in sustainable economic activities.

By addressing these barriers and enhancing the enablers, stakeholders can effectively support women's economic empowerment within the circular economy, ultimately contributing to the reduction of the gender wealth gap and fostering a more inclusive and sustainable economic future.

The evidence presented in this research underscores the critical need for continued exploration and support of circular economy initiatives that prioritize women's financial resilience, thereby paving the way for sustainable development and gender equality in India and beyond.

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Small Tea Growers in Assam in the Context of Circular Business

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ABSTRACT

India is the world's second largest tea producer. The tea industry plays a crucial role in generating significant employment opportunities and contributing to export revenues. The state of Assam is the largest contributor to tea industry with more than 50 per cent contribution to the Indian tea industry. In 2022, Small Tea Growers (STGs) made a significant contribution of 52%, employing over three lakh workers and representing approximately 1.4 lakh small tea growers. The tea industry is a critical driver of the economy in Assam as it plays a significant role in its production.

The STGs primarily operate within a linear economic model, ranging from small tea estates to factories and then to the market, following a conventional economic output and distribution framework. Tracking the value chain and value delivery network over the cycle of the tea plantation, production, distribution to consumption involves multiple stakeholders. This aspect is quite under-researched. STGs are facing many challenges – rapid cost increase, drop in price, lack of productivity improvement measures and inadequate nurturing of tea bushes. The supply chain networks face several challenges, such as outdated equipment and insufficient funding, a limited capacity for generating and utilizing business information, an inadequate regulatory framework, and a lack of effective monitoring and traceability systems. More productive and integrated circular business models are required for a transition from the linear economic chain.

This paper aims to investigate how circular economy principles are integrated among small tea growers in Assam. It examines the influence of external agencies on the establishment of small tea businesses and their efforts to enhance production, distribution, and marketing efficiency. The Small Tea Growers cannot work in isolation, stakeholders are important. This paper addresses the perspective of STGs in their sustained efforts. Based on this, the paper asserts that circular business models can be applied in the context of Assam's STGs, aiming for sustainable growth while benefiting local communities.

KEYWORDS: *Small tea grower, Circular economy, Sustainability, Stakeholder, Value chain.*

INTRODUCTION

Assam, famous for its tea, accounts total tea production. A significant factor in this achievement is the increasing involvement of small tea growers (STGs), who are playing an essential role in the industry. In 2022, the contribution of Small Tea Growers (STGs) accounted for 52%, with approximately 140,000 small tea growers employing over 300,000 workers.

Despite their immense contributions, STGs often face challenges like market volatility, lack of infrastructure, and access to technology. However, the concept of a circular economy offers a sustainable pathway for these growers, improving efficiency, reducing waste, and enhancing economic stability. The study tries to explore how small tea growers in Assam can integrate circular business practices to transform their operations, bringing environmental and economic sustainability to the forefront.

THE STGS IN ASSAM

Traditionally, large estates established during the British colonial era dominated tea production in Assam. However, in recent decades, small tea growers have emerged as important players in the industry. Despite their numbers and contributions, small tea growers often face difficulties. Circular economy principles can offer a solution to many of these challenges by rethinking traditional business models.

A study conducted by Dr. Abhijit Das on “An Economic Appraisal Of Small Tea Farms Of Sonitpur District (Assam)” mentioned the appeal of green tea leaf production for local youth due to its profitability, but identifies several constraints, including marketing, financial, and legal challenges. Key marketing issues include price volatility, inadequate storage, processing, and transportation facilities, as well as faulty weighing practices. To support small tea growers, the study recommends replacing old plants with high-yield varieties, utilizing wastelands, and establishing nurseries for technical support. Policies for fair pricing, minimum support prices, and cooperative formation are also advised to consolidate production and secure better prices, thus enhancing the sector’s economic sustainability. (Dr. Abhijit Das, 2019)

The Article “What will drive the small tea growers towards environment-friendly cultivation? Implications from the tea sector in Assam, India” by Nabajyoti Deka, Kishore Goswami and Kumar Anurupam explores the importance of small tea growers (STGs) in Assam’s tea industry and rural economies, highlighting the need for environment friendly practices due to the high-input demands of tea cultivation. To address challenges such as livelihood security, health risks, and climate change, the study advocates for organic farming, which has increased environmental awareness and created new networks and entrepreneurial opportunities for Assam’s STGs. Key factors influencing organic adoption include training, income perception, and support for STG-owned factories. The research highlights the importance of policy interventions in fostering sustainable agricultural practices among smallholder farmers, ultimately contributing to enhanced sustainability within the tea sector. (Nabajyoti Deka, Kishore Goswami, Kumar Anurupam, 2021)

The study on “Economic sustainability of organic cultivation of Assam tea produced by small-scale growers” by Deka and Goswami emphasizes the need to consider the broader socioeconomic context to promote sustainable practices. Small tea growers rely on large tea estates for essential support in infrastructure, processing, and marketing of their tea as illustrated by (Sharma and Barua, 2017; Munasinghe et al., 2017; Biggs et al., 2018) and quoted by (Nabajyoti Deka, Kishore Goswami, 2021). As illustrated by (Biswas, 2016; Sharma and Barua, 2017) and quoted by (Nabajyoti Deka, Kishore Goswami, 2021) many small growers spend their income on buying chemical fertilizers and pesticides. The study highlights the importance of organic agriculture for better environmental management and suggests that understanding the economic aspects of organic farming is crucial for encouraging its adoption among small-scale growers. Transitioning to organic cultivation could benefit both the growers and the environment, offering a pathway toward more sustainable tea production. (Nabajyoti Deka, Kishore Goswami, 2021)

A study on the “The tea landscape of Assam: Multi-stakeholder insights into sustainable livelihoods under a changing climate” conducted by Eloise M. Biggs, Niladri Gupta, Sukanya D. Saikia and John M.A. Duncan have pointed out that tea production, which sustains the livelihoods of millions, faces significant threats from a range of social and environmental challenges, particularly climate change. As illustrated by Goswami, 2011 and quoted by Biggs et al., 2018, small tea growers face significant challenges in accessing crucial information related to water resource management, crop shading techniques, soil erosion control, land degradation reduction, and the appropriate application of fertilizers and pesticides. Consequently, their production is hindered, and they encounter sustainability challenges stemming from inadequate sectoral regulations, environmentally unsustainable farming practices, low traceability, and inferior quality crops, among other issues. Poor tea production practices can cause adverse environmental impacts. (Eloise M. Biggs, Niladri Gupta, Sukanya D. Saikia, John M.A. Duncan, 2018)

Collaborative efforts are crucial to ensure that these challenges are addressed effectively. With increasing awareness of sustainability and the need to protect the

environment, the circular economy has emerged as a promising alternative.

OBJECTIVES OF THE STUDY

1. To gain insights into the existing practices and obstacles encountered by Small Tea Growers (STGs) in Assam.
2. To identify opportunities for implementing circular economy practices in small tea gardens of Assam.
3. The objective is to examine the involvement of stakeholders in the value chain, particularly focusing on how they contribute to the integration of circular economy principles among small tea growers in Assam.

METHODOLOGY

This research employs a comprehensive approach that integrates both primary and secondary data collection methodologies. Primary data was primarily obtained through in-depth interviews conducted with small-scale tea growers, while secondary data was sourced from scholarly articles, government publications, and relevant literature pertaining to the tea industry and circular economy. The study was executed across three key tea-producing districts in Assam: Dibrugarh, Golaghat, and Nagaon. A total of 30 small tea growers were systematically selected for participation in the research. To facilitate data collection from these growers, a meticulously structured questionnaire was developed.

VALUE CHAIN AND VALUE DELIVERY NETWORK

Circular economy is an emerging economic model that encourages resource production by adopting the principles of reusing, repairing, and recycling existing products for maximum utilization. The circular economy fundamentally revolves around the core principles of minimizing waste and pollution, ensuring that products and materials are continuously utilized, and restoring natural ecosystems. The value chain and the circular economy are closely related, as both concepts focus on creating efficient, sustainable systems for producing and distributing goods. By integrating circular economy principles, value chains can not only contribute to

environmental sustainability but also enhance resilience, reduce costs, and open up new business opportunities.

In the context of Assam's small tea growers, value chain analysis is essential for understanding how tea leaves journey from the grower's gate to the consumer's cup, with a particular focus on circular business practices. This value chain encompasses multiple actors, including green leaf collectors, processors, wholesalers, and retailers, each contributing to the overall quality and value of tea. Within this framework, a circular business model emphasizes minimizing waste and maximizing resource efficiency throughout the chain. For example, tea gardens can implement practices to recycle by-products like tea stems and leaves as organic fertilizers, thus reducing waste and creating a closed-loop system. Consumers, who are considered supporters in this value chain, play a vital role as their purchasing choices directly impact the sustainability of these practices. By leveraging circular principles, small tea growers in Assam can not only enhance profitability but also promote eco-friendly practices, fostering a sustainable tea industry that benefits both the community and the environment.

A study conducted by Dr. Abhijit Das on "An Economic Appraisal Of Small Tea Farms Of Sonitpur District (Assam)" has mentioned about the value chain in tea production highlighting the role of green leaf collector, processor, wholesaler, retailer and consumer.

A study conducted by Nabajyoti Deka and Kishore Goswami on "Organic cultivation and sustainable value chain development for tea smallholders: Findings from Assam, India" mentioned that tea smallholders are essential contributors to the global tea industry, especially in rural economies such as Assam. Despite their importance, they face challenges in achieving sustainability due to limited involvement in the tea value chain. The shift towards organic cultivation has empowered smallholders to participate in processing and marketing, thereby establishing an alternative value chain. Research suggests that to enhance sustainability, it is crucial to involve more growers in the value chain through collective actions supported by producer organizations. Effective policies focused on governance, trust-building, and strategic collaboration will empower smallholders and promote sustainability

in tea production. The smallholders typically focus on cultivating and supplying green tea leaves to large processing units, limiting their role in the tea value chain. However, establishing collectively owned small processing units can enhance their participation and performance. This study aims to explore how certified organic cultivation can transform the tea smallholders' sector, enhance value chain participation, and contribute to sustainable agri-food systems. (Nabajyoti Deka, Kishor Goswami, 2022)

CIRCULAR ECONOMY IN TEA INDUSTRY

Circular economy in tea industry can be looked into by minimizing waste and pollution and maximizing the resource efficiency throughout the entire process of production to distribution of tea.

Circular Economy & Small Tea Growers, Assam

Implementation of circular economy by the STGs increases sustainability. The Circular economy encourages the STGs to minimize waste generation during cultivation, harvesting and processing with the following practice:

- A) **Waste Management:** Scientific waste management in tea cultivation will be benefited for small tea growers, the environment, and the overall sustainability of the tea industry. Circular economy practices promote recycling of organic waste generated in tea gardens such as pruned tea leaves, stems, and organic residues into compost. This helps reduce in chemical fertilizer usage, minimizing soil degradation and pollution, improve soil health and fertility leading to better crop yields.
- B) **Water Management:** Rain water harvesting for irrigation shall reduce dependence on groundwater. Reusing of tea processing water can be a great source of irrigation in tea gardens. Further, steps to be taken to protect and restore natural watersheds to maintain water cycles and quality.
- C) **Organic Farming:** Organic farming increases crop quality and price while also reducing production costs. It helps improve farmers' health and well-being and enhances food security. Additionally, organic farming contributes to soil conservation, biodiversity, and pollution reduction.

- D) **Agroforestry and Biodiversity:** Agroforestry and biodiversity in tea cultivation promote ecological balance and sustainability. Agroforestry diversifies income streams and improves production and quality. It helps in soil conservation and controls erosion. Biodiversity improves ecosystem services, enhances soil fertility, increases water retention and helps in climate change resilience.
- E) **Renewable Energy for Tea Processing:** STGs are usually dependent upon the large tea factory to process their green leaves into finished tea products. Renewable energy such as solar power, wind power, biomass energy can be used by the STGs in collaborative way to avoid dependency on large tea factories.
- F) **Packaging:** Packaging of tea in a circular economy focuses on reducing waste, promoting sustainability, and minimizing environmental impact. The circular economy promotes the following design of packaging: -
 - i. Biodegradable packaging,
 - ii. Compostable packaging,
 - iii. Reusable containers,
 - iv. Minimal packaging,
 - v. Recyclable materials.

Current Practices Among STGs

The survey reveals that the majority of STGs in Assam are following traditional farming methods. Key finding includes –

- A) **Chemical fertilizer and pesticides:** Most of the STGs are dependent on chemical fertilizers and pesticides to increase productivity. Only a small percentage of STGs are using organic alternatives like compost.
- B) **Waste disposal:** Pruned tea leaves, branches and other plant waste are mostly discarded or burned, which is contributing to environmental degradation.
- C) **Water management:** Most gardens rely on natural rainfall for irrigation, with little use of water conservation methods. Water shortages during dry seasons are common.

D) Energy use: Most small tea growers send their leaves to nearby factories for processing, meaning they have limited control over energy usage. Renewable energy solutions for decentralized processing are not commonly used.

Challenges of Circular Economy

Though studies reveal that the circular economy in the tea industry will increase sustainability, there are some challenges in the adoption of the circular economy, which can be summarized as follows:

Economic Challenges: The adoption of the circular economy invites a high upfront cost for sustainable infrastructure. Initially, production costs will increase for organic practices, and costs will also rise due to high biodegradable packaging.

Technical Challenges: The major technical challenges in implementing the circular economy are limited understanding of circular economy principles, limited availability of sustainable technology, lack of standardization in biodegradable packaging, insufficient data on circular economy benefits, etc. Lack of adequate storage of tea leaves is also a major challenge.

Social Challenges: The primary challenge of the circular economy is educating farmers and producers on circular economy practices. Furthermore, the adoption of the circular economy by the STGs changes the target consumers, and as such, changing consumer behaviors and preferences may be a concern for the STGs. Ensuring fair labor practices in circular economy supply chains and managing stakeholder expectations are also issues that need to be addressed by the STGs.

Potential Of Circular Economy

The study identified several opportunities for small tea growers in Assam to adopt circular economy practices, which can be categorized as follows:

A) Production and Processing: During production, utilizing tea leaves, stems, and soil in composting enriches the soil with nutrients and improves its structure. Tea waste can be converted to biogas, a renewable energy source, which helps in tea processing. Crop rotation and intercropping are the farming practices that can improve soil health, increase crop yields, reduce the need for fertilizers, and create additional revenue streams.

B) Packaging and Distribution: Biodegradable packaging can significantly reduce landfill waste, which includes plant-based plastics, paper, and other natural fibers that decompose without harming the environment. Streamlining logistics can reduce carbon footprints associated with transportation, which includes optimizing delivery routes, using eco-friendly vehicles, and consolidating shipments to minimize trips.

C) Waste Reduction and Utilization: Converting tea waste into energy can provide a renewable energy source. This not only addresses waste disposal issues but also contributes to energy sustainability. Transforming tea waste into products like tea oil or cosmetics can create additional revenue streams.

D) Water Conservation: Rain water harvesting can significantly reduce reliance on traditional water sources. Implementing systems to treat and reuse wastewater for irrigation or other agricultural purposes can conserve fresh water. E) Energy and Emissions: Integrating renewable energy into tea production can reduce reliance on fossil fuels. Switching to electric vehicles for distribution can minimize emissions. Optimizing logistics and using local supply chains can reduce the carbon footprint associated with transporting tea products.

Exploring Incremental Innovation

Increased transaction costs and market imperfections have already posed challenges for the STGs. The circular economy provides substantial potential to combat these challenges. Promotional organizations like the Tea Board and Tocklai Tea Research Institute can play a decisive role in harnessing the potential of the STGs. Smallness has its own advantages. As the saying goes, “small is beautiful.” To that extent, the STGs should look forward to institutionalizing incremental innovation.

CONCLUSION

The practice of the circular economy by the STGs can mitigate environmental impacts, improve social outcomes, and enhance economic benefits, ultimately contributing to a more sustainable future. The research highlights the opportunity for Small Tea Growers (STGs) to evolve from conventional, linear

agricultural practices to a more sustainable, circular economy framework, notwithstanding the challenges that may arise. This study serves as a call to action for stakeholders to collaborate and support STGs in transitioning towards a more sustainable, circular economy model. This approach would also promote a more integrated and resilient supply chain, ultimately benefiting both the growers and the local communities involved in the tea value chain.

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Influencer Marketing on Consumer Buying Decision: A Case Study of Manipur

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ABSTRACT

This study primarily aims to evaluate the degree to which social media influencers affect consumer purchasing choices and to explore potential differences among different age groups regarding the influence of these influencers on such decisions. An intricately crafted influencer marketing strategy is anticipated to boost sales while also cultivating trust, loyalty, and authenticity for a business. Different social media platforms, including YouTube, Instagram, and Facebook, could influence consumer behaviour. This investigation utilises a descriptive research design, employing primary data collected through a structured questionnaire. The findings reveal a significant impact of social media influencers on consumers' buying choices, with marked differences observed across various age demographics regarding this influence.

KEYWORDS: *Influencer marketing, Consumer, Buying decision, Brand.*

INTRODUCTION

Influencer marketing involves the marketing of products and services on social media platforms through influential people popularly known as influencers. Influencers are those who due to their knowledge, skill, and character but not position, influence on attitudes of certain groups of people becoming an influencer involves a bond built with trust with the followers, where every opinion of his/her has thousands of followers agreeing to him or her. The era of the internet has changed the way people view today's world. With the development of information and communication technologies, businesses or corporate firms are facing difficulty in attracting consumers/customers for their outputs. The traditional way of marketing is insufficient to capture the target markets. Nowadays, the internet has become a sphere of managing relationships between producers and consumers in today's globalization era. Although the business environment has become more dynamic and competitive, e-marketing has enabled businesses to view the world as a potential market. A mix of conventional and e-marketing has now become

the effective way of marketing strategies in the present century and these arise a new way of marketing termed as influencer marketing.

This study seeks to shed on light whether the customers of Thoubal District, Manipur are influenced by the trendy way of utilizing the influencers as a strategy for marketing by the companies, especially those who have access to social media platforms.

LITERATURE REVIEW

[1] claims that since social media has made it easier to share experiences and opinions, people are more likely to believe those statements to be trustworthy. [2] assert that one of the main tenets of influencer marketing is that customers have always placed a higher value on opinions from others than on advertisements. In order to spread the company message to a wider audience, [3] discovered that influencer marketing is centered on utilizing people who have impacted prospective customers and focusing marketing efforts on them. For example, in their research on social media influencer marketing among clothing buyers. [4] discovered

that the degree of social attractiveness of influencers, which influences consumers' purchasing decisions, is significantly influenced by their age. [5] shows that opinions on the information provided by influencers will affect the choice to buy. Further shows that a consumer's purchasing intention is significantly influenced by the attitude and credibility of influencers. [6] revealed that the efficacy of influencer marketing strategies can be enhanced by innovative contributions that examine the impact of increased customer loyalty on followers' imitation of choices and the priming effects of diverse platforms providing unique experiences. Social media influencers are persons who cultivate a following of adherents and individuals who place their trust in them. They also have the ability to improve consumption habits and impact the behavior of their audience. [8] Social media influencer marketing gave brands new ways to interact with their customers in their daily lives, both directly and naturally and at scale. [9] discovered in their study that 82% of people are willing to heed the advice of an influencer and that influencers are seen as more informed, believable, and credible. The cost-effectiveness of influencer marketing and the audience's sense of intimacy with influencers over celebrities are two of the main reasons why marketers are moving to this strategy [10], [11]. According to earlier studies, consumers view influencers as more reliable than regular celebrities and are more favorable to a company that they support when an influencer is used instead of a traditional celebrity. [12], factors that increase or decrease the impact of influencers are also highly influenced by the authenticity of the influencers and jealousy. It is discovered that respondents have greater positive opinion of high-sincerity influencers; however, for a symbolic product, the influencer's high sincerity had no effect on the brand attitude.

During the review of the literature, while a good number of papers are found, any studies that concerns Manipur had not been encountered. The present study is undertaken to see from Manipur's context.

OBJECTIVES OF THE STUDY

1. To assess the level of social media influencer's impact on consumer buying decision
2. To examine whether there is a significant difference among the different categories of age regarding

Social Media Influencers' Influence on consumer buying decision

METHODOLOGY

A descriptive research design was followed in the study. The required primary data were collected from the Thoubal district of Manipur. The secondary data were collected from various sources of information including journals, books, etc. The data were collected from 150 respondents using convenient method. For the analysis, the study considered descriptive statistics including simple percentages, frequency tables, and Diagrams. An index was developed to measure the level of influence. 1 weight was given for each statement if the respondent replied 'yes'. If the respondent replied 'no' or 'can't say', no weight was given. There were seven statements in the questionnaire. Hence, total weight = $150 \times 1 \times 7 = 1050$. The level of impact is divided into three ranks and it is shown in table 1.

Table 1. Level of Impact

Rank	Score	Level
1	Below 350	Low
2	350-700	High
3	700-1050	Very High

Source: developed by authors

Data analysis and interpretation

- (a) Demographic Profile of the respondents: Out of the 150 respondents, the majority of them (53.3%) are women and one respondent is found to be transgender. Of the total respondents, 60.0% are between the ages of 15 and 25, and 24.7% are between the ages of 25 and 35. The rest are found to be above 35 years. with 37 (24.7%). Regarding occupation, 59.3% are found to be students, and 26.0% are found to be salaried persons.
- (b) Social Media Platforms used by the respondents: Four different types of social media platforms are found to be used by the respondents. They are: Facebook, YouTube, Instagram, and X, which was known as Twitter. It is found that 38 % of the total respondents are found to be using Instagram, 32% are found to be using YouTube, 20 % are found to be using Facebook and the rest 10% are found to be using X.. It is shown in diagram 1.

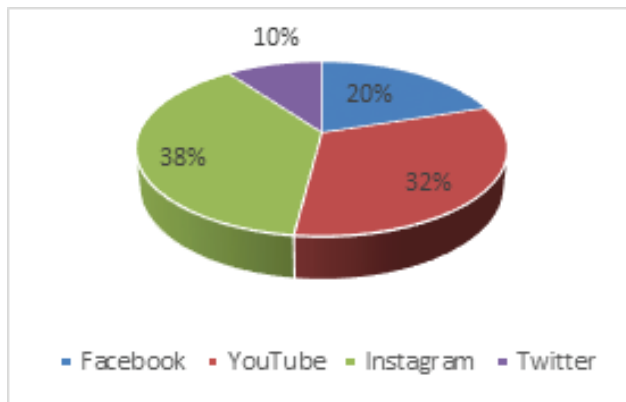


Diagram . 1. Social Media Platform used

Source: fiend survey

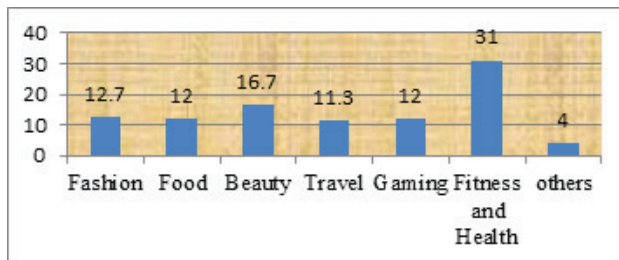


Fig. 2: Influence on Buying decision of different items

Source: field survey

- (c) **Social Media Influencers' Influence on Buying Decision:** The respondents are found to be influenced by social media in making buying decisions of all the items; from food to fitness and health, social media platforms influence the respondents. The findings reveal that 33 % of the total respondents are influenced in buying / consuming fitness & health-related items, 16.7 % are influenced by buying beauty products 12 % each are influenced by social media in fashion and gaming. The details are shown in diagram 2.
- (d) **Time Spend on Social Network:** In a month, on average, about half of the total respondents (48 %) spend 30 -60 hours, 38% of the total respondents spend more than 60 hours and the remaining 14 % spend less than 30 hours on social media respectively.
- (e) **Method of Communication Preferred by Respondents:** The method of communication preferred by the consumer is divided into three

categories; they are : (a) text, (b) video, and (c) photograph. The result shows that the text method is the highest preferred (48.7%), followed by video 41.3% and the least preferred method is the photograph (10%).

- (f) **Impact of Social Media Influencers on Consumer Buying Decision:** The findings are shown in Table 2. According to 53.3 % of the total respondents, more frequent announcements impact the greater attention towards the influencers. 64 % of the total respondents search for products used and recommended by influencers; 50.7 % of the total respondents buy products used and recommended by influencers. 59.3% of the total respondents discuss with their loved ones the products used and recommended by influencers. 44 % of the total respondents recommend products used and recommended by influencers. About 35% of the total respondents pick the product recommended by influencers when there is competition. And, about 40 % (39.3) usually feel satisfied if they buy a product based on influencer recommendations.

Here, is the total score:

$$= 492 (80+96+76+89+66+53+59) \times 1 = 492;$$

3. Since the calculated score is found to be between 350-700 and in rank 2 which is shown in the methodology section, it can be said that there is a high level of social media influencer's impact on consumer buying decisions in the study area.

Table 2: Impact of Social Media Influencers on Consumer buying decision

S. No	Statements	yes	no	Not to say
S1	More frequent announcements impact the bigger attention towards the influencers	80 (53.3)	34 (22.5)	36 (24.8)
S2	I search for products used and recommended by influencers.	96 (64)	45 (30)	9(6)
S3	I buy products used and recommended by influencers.	76 (50.7)	57 (38)	17 (11.)

S4	I discuss with my loved ones the products used and recommended by influencers.	89 (59.3)	45 (30)	16 910.7)
S5	I recommend products used and recommended by influencers.	66 (44)	65 (43.3)	19 (12.7)
S6	When there is competition, I pick the product recommended by influencers	53 (35.3)	73 (48.7)	24 (16)
S7	I usually feel satisfied if I buy a product based on influencer recommendations.	59 (39.3)	59 (39.3)	32 (21.3)
Total		492	378	153

Source: field survey

Fig in parentheses shows the percentage

- (g) Social Media Influencers' Influence on consumer buying decision among different age groups: To examine whether there is a significant difference among the different categories of age regarding Social Media Influencers' Influence on consumer buying decisions, an ANOVA test was conducted and the results were shown in table 3. Here, five statements that have more than 65 'Yes' responses (table 1) are considered and a 5 percent level of significance is considered to take the decision.

Table 3: Testing on Significant Difference among Age of respondent on Social Media Influencer's Influence

Statement		Sum of Square	df	Mean Square	F	Sig.
S1	Between Groups	4.883	3	1.628	1.462	.227
	Within Groups	162.557	146	1.113		
	Total	167.440	149			
S2	Between Groups	4.043	3	1.348	1.084	.358
	Within Groups	181.530	146	1.243		
	Total	185.573	149			
S3	Between Groups	13.694	3	4.565	4.256	.006*
	Within Groups					
	Total					

	Within Groups	156.579	146	1.072		
	Total	170.273	149			
S4	Between Groups	15.111	3	5.037	3.683	.014*
	Within Groups	199.662	146	1.368		
	Total	214.773	149			
S5	Between Groups	13.355	3	4.452	3.595	.015*
	Within Groups	180.785	146	1.238		
	Total	194.140	149			

Source: computed based on field survey

*Significant at 5% level of significance

Table 3 shows that for S1 and S2, the f values are 1.46 and 1.84 respectively; for both cases, $p > 0.05$; shows that there is no difference among the different age groups concerning searching for products used and recommended by influencers. However, in the case of S3, S4, and S5, $p < 0.05$; hence, it can be that there is a significant difference among the different categories of age regarding Social Media Influencers' Influence on the consumer buying decisions.

Major Findings and future scope of study

Major Findings

- The majority of respondents are female, with the largest contingent originating from the student demographic.
- Amongst the social media platforms, Instagram has the maximum.
- 'Text' is the highest preferred mode of communication among the respondents.
- Social media influencers have an immense impact on the choices made by customers.
- There is a notable disparity among the age groups of respondents concerning the influence of Social Media Influencers.

Future scope of study: Further study may be conducted by taking a larger sample size and covering different parts of India. An in-depth study may be undertaken considering the youths and women too.

CONCLUSION

Social media through the internet would influence the thinking level of people but sometimes it can lead to unmatched decisions with reality. This study reveals the importance of social media and its level of impact on buying decisions. Modern marketing activities are not possible by relying only on traditional marketing systems. In the present scenario, the world is like a global village and social media platforms connect in many ways. People are using social media platforms in many ways, celebrities, companies, government, individuals, etc., use social media platforms not only for sharing information but also use a means of effective marketing. People can search for a product through social media platforms and buy a product through such platforms. Though there are certain issues, social media platforms are highly helpful in searching for information before buying a product. The results strongly indicate that consumers are driven and impacted by the influencers which leads to alteration of their perspectives regarding their purchasing choices.

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Green Practices in Global Supply Chains: Opportunities and Challenges for Trade and Investment

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ABSTRACT

The integration of green practices in global supply chains has emerged as a critical focus in the modern business environment, driven by the dual imperatives of environmental sustainability and economic competitiveness. This paper examines the opportunities and challenges associated with implementing green practices in global supply chains. It explores their impact on trade and investment, highlighting how environmental considerations are reshaping traditional supply chain models. Key opportunities include cost reduction, innovation, and improved market access, while challenges encompass compliance costs, lack of uniform regulations, and technological barriers. This study aims to provide a comprehensive understanding of how green practices can contribute to sustainable trade and investment strategies.

KEYWORDS: *Green practices, Global supply chains, Sustainability, Trade, Investment, Environmental regulations, Economic competitiveness.*

INTRODUCTION

Modern trade is largely driven by interconnected global supply chains, which link businesses worldwide and play a pivotal role in fostering economic growth. However, as environmental sustainability gains critical importance and the urgency to combat climate change intensifies, traditional supply chain models face increasing scrutiny. Green supply chain management (GSCM) has emerged as a solution to reduce the environmental impact of supply chains while maintaining efficiency and competitiveness in international trade.

GSCM involves implementing eco-friendly practices throughout the supply chain, from minimizing waste and optimizing logistics to adopting sustainable sourcing and energy-efficient manufacturing processes. Companies across various sectors are integrating green methods to meet consumer demands for environmentally friendly products and align with global sustainability benchmarks such as the Paris Agreement and the United Nations Sustainable Development Goals (SDGs).

Adopting green practices presents numerous opportunities for businesses, including cost savings through resource optimization, improved brand reputation, regulatory compliance, and access to new markets driven by environmentally conscious investors and consumers. Technological advancements and innovative solutions have further enhanced the appeal of sustainable and efficient supply chains, enabling companies to differentiate themselves in competitive markets.

Despite these advantages, transitioning to green supply chains presents challenges. Significant initial investments are often required, and established businesses with entrenched supply chain processes may resist change. Inconsistent global regulations and a lack of standardized certifications, particularly in developing countries, complicate the widespread adoption of environmentally friendly operations. Furthermore, trade and political barriers can hinder the cross-border acceptance of green practices.

Nonetheless, the potential benefits of green supply chains in enhancing trade and investment—by attracting

sustainable foreign direct investment (FDI) and promoting eco-conscious trade relations—underscore their critical role in shaping the future of the global economy.

OPPORTUNITIES IN GREEN PRACTICES FOR GLOBAL SUPPLY CHAINS

Cost Reduction and Efficiency Gains

Implementing green practices can lead to significant cost savings by optimizing resource utilization and reducing energy consumption. For instance, lean manufacturing techniques and green logistics minimize waste and improve efficiency.

Market Differentiation and Brand Value

Adopting environmentally friendly practices enhances brand reputation and customer loyalty. Companies that integrate sustainability into their supply chains often gain a competitive edge in markets prioritizing eco-consciousness.

Innovation and Technological Advancement

Green practices encourage innovation, leading to the development of advanced technologies such as energy-efficient machinery and sustainable packaging solutions. These innovations often create new investment opportunities and drive industrial growth.



Access to Green Financing

Financial institutions increasingly offer preferential loans and investment schemes to companies embracing green practices. This access to green financing reduces capital costs and supports long-term sustainability goals.

CHALLENGES IN IMPLEMENTING GREEN PRACTICES

High Initial Costs

Transitioning to green practices often involves substantial upfront investments in technology, infrastructure, and training. These costs may deter small and medium enterprises (SMEs) from adopting sustainable strategies.

Regulatory Complexity

The absence of uniform global environmental standards creates compliance challenges for multinational corporations. Navigating varying regional regulations increases administrative burdens and operational risks.

Supply Chain Fragmentation

Global supply chains are inherently complex, involving multiple stakeholders with differing priorities. Coordinating green practices across such fragmented networks requires robust governance mechanisms.

Technological Barriers

The adoption of green technologies is often hindered by limited access to innovation, especially in developing economies. This disparity exacerbates sustainability gaps between regions.

Challenges in Implementing Green Practices

- | | |
|------------------------------|--------------------------------------|
| 01 Cost Implications | 06 Balancing Priorities |
| 02 Behavioral Change | 07 Public Perception and Brand Image |
| 03 Supply Chain Complexity | 08 Measuring Impact and Metrics |
| 04 Regulatory Compliance | 09 Global vs |
| 05 Technological Limitations | 10 Long-Term Vision and Patience |

IMPACT ON TRADE AND INVESTMENT

Enhancing Trade Opportunities

Green practices can open new markets by aligning with international trade agreements emphasizing sustainability. For instance, adherence to carbon-neutral standards facilitates entry into eco-sensitive markets.

Attracting Foreign Direct Investment (FDI)

Countries and businesses prioritizing green practices attract FDI by appealing to investors seeking sustainable and ethical opportunities. This trend reinforces the economic viability of environmentally friendly policies.

Mitigating Trade Barriers

Environmental regulations can act as trade barriers for non-compliant entities. Adopting green practices ensures compliance, reducing the risk of sanctions and fostering smoother trade relations.

CASE STUDIES

Case Study 1: Unilever's Green Supply Chain Transformation

Unilever exemplifies success in adopting green supply chains through its Sustainable Living Plan. The company has achieved significant milestones, including sourcing over 60% of its agricultural raw materials sustainably by 2020 and reducing greenhouse gas emissions from global operations by 65%. Investments in renewable energy, water conservation, and sustainable farming practices have enhanced brand image, reduced operational costs, and attracted eco-conscious consumers and investors. Unilever's achievements demonstrate the profitability and sustainability of integrating green practices into supply chains.

Case Study 2: H&M's Challenges in Green Transition

H&M, a major player in the fast fashion industry, highlights the complexities of adopting green supply chains. Despite its pledge to use 100% sustainable or recycled materials by 2030, the company faces challenges in maintaining transparency and sustainability across its global supply chain, particularly with suppliers in regions with weaker environmental standards. Additionally, the inherent conflict between fast production cycles and sustainability goals underscores the broader struggles

within the industry to balance cost-efficiency with environmental responsibility.

RECOMMENDATIONS AND CONCLUSION

Policy Recommendations

- Governments should establish harmonized environmental regulations to facilitate global compliance.
- Incentives, such as tax benefits and subsidies, should be provided to encourage green investments.

B. Corporate Strategies

- Businesses should adopt a holistic approach, integrating sustainability at every supply chain level.
- Collaboration with stakeholders, including suppliers and consumers, is essential to achieving green objectives.

CONCLUSION

Green practices in supply chains offer transformative opportunities for enhancing trade and investment while addressing pressing environmental challenges. Case studies of Unilever and H&M illustrate both the potential and the hurdles in adopting sustainable practices. While Unilever's success showcases profitability through sustainability, H&M's struggles underline the challenges of systemic change in resource-intensive industries.

As global markets increasingly prioritize sustainability, businesses that integrate green practices will gain competitive advantages, access new markets, and attract eco-conscious investors. Collaborative efforts, policy alignment, and technological innovations are crucial to overcoming barriers and driving the adoption of green supply chains, paving the way for a sustainable global economy.

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Advancing SDG Integration in Tourism Education: Assessing the Preparedness of Indian Tourism Academia

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ABSTRACT

The current research endeavours to assess the preparedness of the tourism postgraduate (PG) course curriculum in India by equipping the aspiring professionals with the concepts and skills required to expedite the Sustainable Development Goals (SDGs). The study first developed a SDG keyword pool specifically designed for tourism education in Indian context to examine and highlight deficiencies in embedding SDGs in the curriculum of the 22 leading universities in India, ranked amongst the best globally, offering tourism Postgraduate courses. The study privileges content analysis method by employing NVivo programme to assess the course offerings. The study reveals a significant shortfall in incorporating SDG-related concepts and keywords within the curriculum offered. In response, the study introduces the Tourism Education for Sustainable Development Keyword (TESDK) framework as a progressive tool aimed at standardizing and future-proofing tourism education. The study constitutes a pioneering effort in the Indian academic landscape, aiming to equip future tourism professionals with the skills necessary for fostering a sustainable and more equitable future.

KEYWORDS: *Education for Sustainable Development (ESD), Tourism education, SDG keyword, Sustainable Development Goals (SDGs), Skilling framework.*

INTRODUCTION

The world faces many challenges regarding the planet and people. Amidst the challenges of environmental degradation, biodiversity loss, desertification, rising sea levels, changing climate and social inequalities, the Sustainable Development Goals (SDGs) envisage a sustainable & peaceful present and future for people and the planet, leaving no one behind [1]. While being an economic powerhouse, tourism industry carries a profound power to strengthen the socio- cultural, political and environmental factors that drive societal change [2]. With its well-established magnitude and multiplicity, tourism could prove to be a positive catalyst of change only if managed mindfully [3]. The pandemic has disrupted many forms of tourism and has presented timely caution regarding the pre-pandemic tourism systems, vulnerabilities, and opportunities; sustainable tourism has been even more relevant during this window period, which provides opportunities to reset

tourism and ensure that it generates better sustainable development outcomes [4]. The United Nations General Assembly envisages that with systematic collaborative efforts of various stakeholders; tourism can contribute to all SDGs. To achieve this objective, the tourism industry needs a knowledgeable workforce that can recognise and address various problems associated with tourism, travel, hospitality, and the increasingly complex operating environment within which they exist. UN Tourism strongly recommends that “Education and skills development are the foundations for building a more sustainable tourism sector”[5].

LITERATURE REVIEW

Education for Sustainable Development and Tourism

Education for Sustainable Development (ESD) emerged from the global recognition of the need to integrate sustainability into educational systems by equipping learners with the necessary knowledge, skills, values,

and attitudes enabling learners to contribute positively towards environmental protection, economic viability and social justice for the present and future generations [6]. Studies highlight the imperative transformation required in tourism education to address destination stewardship skills, political acumen, and ethical awareness [7] [8]. Studies have indicated that “although tourism and business academics agree that sustainability is an important issue, this does not necessarily translate into sustainable curriculum” [9] [10].

Global Initiative to Integrate SDGs in Higher Education Institution’s (HEI) Curriculum

The capacity of HEIs is crucial in helping the global community understand the challenges, opportunities, and relationships of different SDGs, create and implement innovative systems and solutions, formulate and assess policy options and transformation pathways, and track progress towards global goals [11] [12] [13]. Initiatives undertaken by HEIs include but are not limited to policy schemes, institutional missions and strategies, teaching and learning (e.g. curricula, pedagogy, extracurricular activities, and flexible learning pathways), research, innovation, collaborations, partnerships and communication, and green campuses. Carnegie Mellon University assesses its performance voluntarily to review and track how it has implemented SDGs through its courses. The University of Tennessee, Knoxville, US, lets its students tailor their course selection based on the SDG of their choice [14].

SDG Keyword Framework at Global Level

Studies support the fact that mapping the curriculum to the SDGs forms a pivotal step towards embedding sustainability within education [15]. This approach enhances academic rigour and aligns educational outcomes with the pressing needs for global sustainability. The “Compiled Keywords for SDG Mapping”, compiled by Monash University in 2017, a manually created Excel sheet of 915 keywords and another miscellaneous category of words [16]; Elsevier’s SDG search queries [17]; the Inter-Agency and Expert Group’s “The UN Global Indicator Framework for SDGs on SDG Indicators (IAEG-SDGs)” with 231 unique indicators; the ‘University of Auckland SDG Keywords Dictionary Project’ developed by the United Nations and Times Higher Education [18] have been significant contributions.

Sustainable Development Goals (SDGs) and Curriculum

Studies and initiatives across various educational sectors have begun to explore how sustainability principles are integrated into curricula. Studies have assessed the strength of sustainability conceptualizations underpinning international undergraduate sustainable tourism courses and Vocational Training Courses and management courses offered in specific regions [19] [20]. As a sustainability assessment tool for universities, STARS rating was awarded to 588 institutions worldwide as of March 2023 [21].

There have been studies on Education for Sustainable Development [22] [23]. Studies have evidenced that tourism students possess limited understanding of sustainability, owing to weaker conceptualizations of sustainability or absence of holistic, critical and systemic thinking [24] [25]. The study of [26] explored the integration of sustainable tourism principles into the curricula of tourism programs across Indian universities. Study reveals its limited presence as a standalone course in Indian universities.

Despite the growing emphasis on integrating sustainability into higher education at international and national levels, a noticeable research gap exists in developing a comprehensive framework tailored to embed Sustainable Development Goals (SDGs) for tourism education in the Indian context. Thus, the current study scrutinizes the curriculum of leading tourism universities in India against the skilling framework developed to pinpoint gaps in the existing curriculum.

The current research thus endeavours to achieve the below objectives:

- a) Assess the preparedness of postgraduate (PG) courses curricula in India’s tourism academia in equipping aspiring professionals with the concepts and skills to expedite Sustainable Development Goals (SDGs).
- b) Propose an SDG keyword framework for universities to ensure concepts and skills related to achieving SDGs through tourism.

RESEARCH METHODOLOGY

The study is exploratory and follows deductive reasoning as it assesses the existing curriculum using predetermined keywords and principles. While the researchers recognize the fact that curriculum is made up of multiple and dynamic elements, for the study, 'Curriculum' is defined as the academic content offered by postgraduate programmes and its parts that make up a tourism degree in literal terms. Though tourism education in India is offered as part of certificate courses, degree programmes and postgraduate programmes, the study deliberately chose only postgraduate courses as the professionals have access to managerial positions and work closely with policymakers at the regional and national level.

Data Collection

Sampling units were determined by assessing the top 100 universities ranked by 'The Times Higher Education Rankings (THER) available for Internet access and a trusted global source since 2004 [27]. Of the top 1,500 universities ranked globally, 100 from India were screened for further analysis. Out of the 100 universities, 36 offered graduate and postgraduate courses in tourism. Adhering to the aim of the study, the analysis unit was limited to N=24, universities offering postgraduate courses. The global ranking of the universities ranged from rank 501 to 1501. The list comprises Central, State, Private, and deemed to be Universities, criteria followed in India.

The syllabus of all 24 universities was retrieved from the university's official websites. An attempt was made to collect incomplete data or inaccessible file formats by contacting personnel affiliated with the universities for timely data acquisition. The valid sample size was 22 as the detailed syllabus was unavailable for two universities. Data were collected from November 2023 to December 2023. Content analysis was chosen as the preferred method for analysing the curriculum as it supports the objective of the study to literally scrutinize the text and not the probable learnings. The study was not coupled with other qualitative techniques to avoid bias or the forced inclusion of aspects that were not explicitly published in the syllabus.

Formulating Tourism Education SDG Keyword Pool

The next phase of the methodology involved creating a comprehensive set of keywords related to the SDGs and tourism education. The pool was built exclusively to assess the inclusion of SDGs and their related outcomes in the form of academic concepts and principles related to tourism that are apt to the Indian scenario. The keyword list was built by extracting key terms from the UN's (United Nations) SDG indicators document and the 'Auckland Approach' before being manually enriched through a literature review around the SDGs. The keywords compiled by the University of Auckland are a significant and widely accepted result of the University of Auckland SDG keyword dictionary project [28]. The Auckland keyword list is based on Elsevier's SDG search query for published research adopted by the Sustainable Development Solutions Network (SDSN) and United Nations (UN). The keywords were refined, prioritized and recorded in an Excel sheet to suit the study. For instance, SDG 1, aiming at No Poverty, was searched using the keywords poverty alleviation, pro-poor tourism, and microfinance, where the concepts aim to alleviate poverty through tourism to achieve the SDG goal. The final list of sixty (60) keywords was generated to assess 17 SDGs based on the agreement between the authors.

To assess the accuracy and reliability of the keywords, the authors independently performed the study with no interference. Cohen's kappa coefficient was used to test the consistency of the two studies. Cohen's kappa is a statistical coefficient representing the degree of accuracy and reliability. It measures the agreement between two raters (judges) who classify the items into mutually exclusive categories. Jacob Cohen introduced this statistic in the journal Educational and Psychological Measurement in 1960. The Kappa value is always less than or equal to 1. A value of 1 implies perfect agreement, and values less than 1 imply less than perfect agreement [29]. If the K value exceeds 0.75, the coding of the two researchers can be considered reliable. The calculated kappa coefficient was 0.824, indicating that the coding reliability of the two researchers was substantially good, with almost perfect agreement.

All collected syllabi were systematically and separately reviewed by each author. N-Vivo software was used to

run the structured search process with Boolean terms to assess the inclusion of SDG keywords in the syllabus. Each SDG was assessed one at a time to limit, broaden and define the search results, and the query response was recorded for each SDG. Each university was scored using the SDG keyword pool. The counts and frequencies were manually validated and colour-coded to identify the SDG's inclusion level in the curriculum. The significant and wider applicable SDG keywords were manually scrutinized using the references option in the NVivo to ensure applicability and validity.

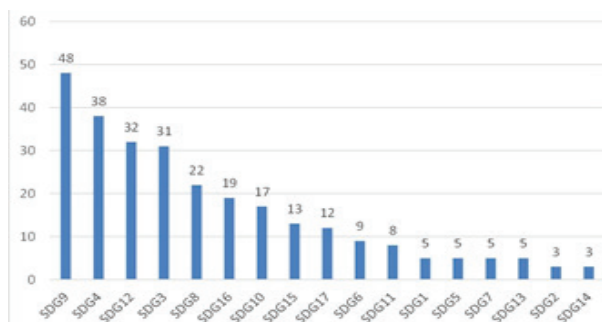


Fig. 1: Frequency of the Occurrence of SDG Keywords in the Tourism Courses Offered by the Higher Education

The content analysis of the tourism curriculum indicated that 36% of the universities (n=8) embedded more than 10 SDGs indicating at least one keyword. The remaining 36% (n=8) of the universities embedded at least eight SDGs in the curriculum indicating at least one keyword. It is alarming that 27% (n=6) of the top-ranked universities in the world embed fewer than five SDGs. The study revealed that none of the universities (n=0) assessed embedded all SDG keywords, thus indicating that the syllabi do not align with the SDGs. (Figure 2)

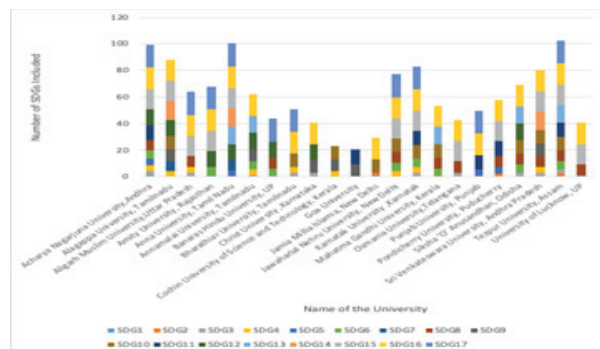


Fig. 2: Inclusion of SDGs in the Course Curriculum by the Indian Universities Institutes

SDG 1 (No Poverty) was investigated using the keywords “Pro-poor tourism” (n=3) and “micro-financing” (n=2). The study indicated poor representation which was embedded in 23% of the courses (n=5). This signifies that although economic impact is included in the syllabus, it does not directly indicate the concepts that assist in reducing the gap towards alleviating poverty through tourism.

SDG 2 (Zero Hunger) was poorly represented by only 14% of the courses (n=3) through the keyword “Agro-based tourism” (n=3). No courses categorically included the keyword “Food Waste Reduction”. This finding serves as a caution to take note of the alarming need to introduce baseline problems to reduce waste and achieve zero hunger through better utilization of food resources and management of leftovers, especially in hospitality.

SDG 3 (Good Health and Well-being) is fairly represented by tourism courses occurring in 86% of the courses (n=19). The SDG goal was assessed using the keywords “Wellness Tourism” and “Yoga” (n=12) along with “Health Regulations” (n=19) which occurred 31 times across the courses, indicating a good representation of the health benefits achievable through tourism.

SDG 4 (Quality Education) was well represented in all tourism courses accounting for 95% representation (n=21) through the keywords “Skills” (n=22), “Vocational Training and Internships” (n=15) and “Interpretation and Information Centres” (n=1). The emphasis placed on lifelong learning through tourism is undeniable as the students are exposed to various skills and learnings in the formal setting which in turn can be applied in the real world in the form of practical training, internships, vocational training or access to information and interpretation centres at the destinations.

SDG 5 (Gender Equality) had below average representation of 18% (n=4) in the tourism syllabi. The tourism industry’s contribution in providing equal and fair opportunities for all segments is well documented. While the syllabus has the representation of “Gender equality” (n=1), “occupational safety” (n=3) and “women empowerment” (n=1), the research shows no indication of “Safe destinations” and “Women Travellers” taking into consideration the varied segment of travellers.

SDG 6 (Clean Water and Sanitation) occurred in 41% (n=9) of the tourism syllabi indicating average inclusion. Water is the basis of life and sanitation is of immense importance for the planet. Sustaining the source and improving the quality of basic resources results in the development of other significant areas, such as health and education. There was no occurrence of the words “Water Management”, “Waste Water Management”, and “Eco-efficiency”, while only one course mentioned “Water Harvesting”. The keyword “Sanitation” was used in 08 courses.

SDG 7 (Affordable and Clean Energy) was indicated in the tourism syllabi through the keywords “Green Energy” (n=1), “Renewable Energy” (n=2) and “Energy Conservation” (n=2). Keywords were included in 14% of the courses (n=3) and had no significant representation. While the tourism industry has been a significant contributor to carbon emissions from fossil fuel consumption, the inclusion of the keywords “Energy Management” was Nil.

SDG 8 (Decent Work and Economic Growth) had a fair representation occurring in 68% (n=15) of the tourism courses. The keyword “Economic development”, being one of the major impacts of tourism had an average representation (n=10) followed by “Community Based Tourism” (n=7) and “Labour Laws and Minimum Wages” (n=5). The keywords “Social Entrepreneurship” and “Circular Economy” had no representation in any of the tourism courses that aligned with the goal of sustained, inclusive and sustainable economic growth ensuring decent work for all.

SDG 9 (Industry, Innovation, and Infrastructure) was the most represented SDG with 95% (n=21) of the tourism courses, indicating it through the keywords “Sustainable Tourism Development” (n=28), “Innovation and Creativity” (n=36) and “Digital Tourism or E-Tourism” (n=14). While the courses covered the aspects of infrastructure development, there was no indication of “Resilient Infrastructure” or “Sustainable/Green Infrastructure”. The aspects of innovation, creativity, and e-tourism had an average spread of inclusion, as approximately 64% of the courses indicated these crucial concepts.

SDG 10 (Reduced Inequality) had a fair representation of 55% (n=12) of the courses, indicating inclusion through

the keywords “Cross-Cultural Sensitization” (n=12), a crucial aspect to be exposed to future professionals in the tourism and hospitality industry. The keywords “Inclusive Tourism” (n=5) and “FDI” (n=3) were the least represented. Though the curriculum takes note of cultural pluralism, all the courses miss out on the most important concepts of the “Global Code of Ethics” and “Social Equality”, which upholds the role of tourism in achieving inequality within and among the countries as these keywords were missing in the curriculum.

SDG 11 (Sustainable Cities and Communities) was poorly represented compared to its heightened importance in the current times, as only 32% of the courses include it in the syllabus and appears at a frequency of eight times (n=8). Representation was assessed using the keywords “Destination Management” (n=13), “Sustainable Destination” (n=6) and “Heritage Preservation/Conservation” (n=2). While the SGD commits to making cities and settlements more sustainable, safe and resilient, the study indicates no inclusion of the keywords “Regenerative Tourism” and “Sustainable Transport” which seems to be imperative for the postgraduate students to be acquainted with.

SDG 12 (Responsible Consumption and Production) had the third highest representation (n=32), which was included in 86% (n=19) of courses. The representation was further analysed using the keywords “Eco-Tourism and Responsible Tourism” (n=19), indicating a fair inclusion, while the keywords “Environmental Impact Assessment EIA” (n=6) and “Eco Labels/Certifications” (n=1) had poor inclusion. This study indicates that four universities offer exclusive papers on Ecotourism and Responsible Tourism. The study indicates no representation of “Sustainability Indicators”, such as the Sustainable Tourism Criteria for India (STCI) and the Global Sustainable Tourism Council (GSTC) criteria.

SDG 13 (Climate Action) had very poor representation in the tourism syllabi, occurring only five times in 23% of the courses (n=5) offered. The keywords “Climate Change” had fair inclusion (n=10), followed by “Global Warming” (n=6) and “Disaster management” (n=5). Only one university offered a full paper on disaster management. While the world is coming together to take urgent action to combat climate change, the study indicates no inclusion of the keywords “Climate

Action,” “Climate Crisis,” and “Carbon Neutral/Carbon Footprints.”

SDG 14 (Life below Water) had the lowest representation, with only 14% of the courses indicating keywords related (n=3). The keyword “Blue Economy” and “Integrated Coastal Zone Management” occurred only once. The study provided no occurrence of the keywords “Marine Biodiversity Management” and “UN Law of the Sea,” which could contribute towards conserving marine resources while ensuring sustainable usage of Oceans and Seas, which form the basic and important resources for the tourism industry.

SDG 15 (Life on Land) was indicated by 55% of the courses with an average occurrence (n=13) through the keywords “Eco-System Conservation” (n=8), “Biodiversity Protection/ Environment Protection” (n=6) and “Natural Heritage Conservation” (n=02). While the goal is to “Protect, restore and promote sustainable use of terrestrial ecosystems, ensuring sustainably managed forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss,” the study indicates no inclusion of the keywords “Eco System Protection” and “UN Red List” in the curriculum which could bring about a fair representation of the current challenges in managing the life on land sustainably.

SDG 16 (Peace, Justice, and Strong Institutions) had a good representation of 84% of the courses (n=19) through the keywords “Tourism Laws and Regulations.” Though the study represents a good representation of the laws and regulations enacted by the authorities, further assessment indicates no courses exclusively indicate the words “Consumer rights” or “Rights of the Tourists” making it service provider-centric. The study indicated absence of the keywords “International Code for Protection of Tourists” and “Consumer Protection Act for Tourism in India”, though it is acclaimed to be a significant development of the tourism industry towards providing access to justice through effective, accountable and inclusive policies and institutions.

SDG 17 (Partnerships for the Goals) had an average representation of 50% (n=11) of the courses, indicating inclusion through the keywords “Public Private Partnership” (n=6). While tourism has proven to be one of the strongest means of strengthening implementation

and revitalizing the global partnerships with the fundamentals of sustainability, the curriculum has no inclusion of the keywords “Global Partnerships” and “International Partnerships”

FINDINGS AND DISCUSSION

The analysis shows that, in line with international reports, Indian universities’ curricula imbibed the skills and concepts related to SDG 9 (Industry, Innovation, and Infrastructure), SDG 4 (Quality Education and lifelong learning through information and interpretation centres), SDG 12 (Responsible Consumption and Production), SDG 3 (Good Health and Well-being), SDG 8 (Decent Work and Economic Growth), SDG 16 (Peace, Justice, and Strong Institutions), SDG 10 (Reduced Inequality), SDG 15 (Life on Land), and SDG 17 (Partnerships for the Goals).

There is an alarming gap in the skills and concepts imparted by universities regarding SDG 14 (Life Below Water), SDG 2 (Zero Hunger), SDG 1 (No Poverty), SDG 5 (Gender Equality), SDG 7 (Affordable and Clean Energy), SDG 13 (Climate Action), SDG 11 (Sustainable Cities and Communities), and SDG 6 (Clean Water and Sanitation).

The adoption of “National Strategy for Sustainable Tourism” [30], Travel for LiFE Program [31] under Mission Lifestyle for Environment (LiFE) and Goa Roadmap for Tourism as a Vehicle for Achieving the Sustainable Development Goals [32] indicate the efforts to promote sustainable tourism through mindful behaviour across the generations. The initiatives undertaken at the policy level are not reflected in the curriculum level. Owing to the heightened importance of responsible and sustainable operations in industry, the disconnection between academia and industry is evident. While it may not be just to rely upon the mere inclusion of keywords, the study urges higher education institutions to include and sensitise future professionals to the crucial and contemporary issues and concepts recommended as part of the study.

RECOMMENDATIONS

This deficiency evidenced underscores the pressing need for an overhaul of the syllabus to ensure that future tourism professionals possess the competencies and knowledge necessary to make meaningful and

sustainable contributions to the tourism sector. To address this need, the Tourism Education for Sustainable Development Keyword Framework (TESDK) has been developed as a guiding instrument for institutions to adjust or devise curricula that empower students to actively participate in accelerating SDGs through tourism. (Table 1).

Table 1. Tourism Education for Sustainable Development Keyword (TESDK) Framework

SDG No. & Title	Role of Tourism in Achieving SDG	Key Concepts and Skills Required to Achieve SDGs Through Tourism
SDG 1 No Poverty	Tourism can contribute to poverty reduction by creating job opportunities, supporting local businesses, and promoting inclusive economic growth.	Pro-Poor Tourism Micro-financing
SDG 2 Zero Hunger	Tourism can support local agriculture and food production, contributing to food security and reducing hunger.	Agro-Based Tourism Food Waste Reduction
SDG 3 Good Health and Well-being	Tourism can promote wellness contributing to improved health and well-being	Wellness and Medical Tourism Yoga, Ayurveda and Alternative wellness systems Health Regulations
SDG 4 Quality Education	Tourism can support educational initiatives and promote cultural exchange, contributing to quality education.	Community Information Centres Indigenous Knowledge Cross-Cultural Skills Green Skills Vocational Training / Internship
SDG 5 Gender Equality	Tourism can empower women by providing economic opportunities and promoting gender equality.	Safe Destinations Occupational Safety and Health Administration (OSHA) Inclusive Tourism Gender-Specific Tourism Businesses
SDG 6 Clean Water and Sanitation	Sustainable tourism practices can contribute to water conservation and sanitation.	Eco-Efficiency Resource Efficiency Water harvesting, Sanitation Water Management 5Rs of Waste Management
SDG 7 Affordable and Clean Energy	Tourism can promote the use of clean and sustainable energy sources in the hospitality and transportation sectors.	Green Energy Energy Conservation
SDG 8 Decent Work and Economic Growth	Tourism is a significant employer and can contribute to economic growth and decent work.	Community-Based Tourism Dignity of Labour Social Entrepreneurship
SDG 9 Industry, Innovation, and Infrastructure	Tourism infrastructure development and innovation can contribute to sustainable tourism practices	Sustainable Tourism Development Resilient infrastructure Responsible Mobility Environmentally Sound Technology Innovation and Creativity

SDG 10 Reduced Inequality	Tourism can promote inclusivity and reduce inequality by providing economic opportunities to marginalized communities.	Global Code of Ethics Green Finance and Foreign Direct Investment
SDG 11 Sustainable Cities and Communities	Sustainable tourism practices can contribute to the development of sustainable and resilient cities and communities.	Sustainable Heritage Management Sustainable Destination Management Regenerative Tourism Indigenous Knowledge / Local Knowledge
SDG 12 Responsible Consumption and Production	Sustainable tourism practices can promote responsible consumption and production, minimising environmental impact.	Responsible Tourism/Eco-Tourism Environmental Management System (EMS) Environmental Impact Assessment (EIA) Eco Label/Eco Certification
SDG 13 Climate Action	Tourism can contribute to climate action by promoting sustainable travel practices and reducing carbon footprints.	Climate Change and Climate Action Triple Planetary Crisis Disaster Management
SDG 14 Life Below Water	Sustainable tourism practices can contribute to conserving marine ecosystems and biodiversity.	Blue Economy Integrated Coastal Zone Management Marine Biodiversity Management United Nations Convention on the Law of the Sea
SDG 15 Life on Land	Tourism can support the conservation of terrestrial ecosystems and biodiversity.	Ecosystem Conservation Bio-diversity Protection Environment Protection IUCN Redlist Natural Heritage Conservation
SDG 16 Peace, Justice, and Strong Institutions	Tourism can contribute to peace-building and the promotion of strong and inclusive institutions.	Tourism Laws and Regulations National Regulatory Framework for Sustainable Tourism International Code for the Protection of Tourists
SDG 17 Partnerships for the Goals	Collaboration between governments, businesses, and communities is essential for achieving sustainable tourism goals.	Agenda 21 & 30 Global Partnerships Digitalisation

Source: Compilation from the author

Universities and HEIs are strongly encouraged to thoroughly assess their current tourism, travel, and hospitality management programs by utilizing the TESDK framework as a guide. Courses should be designed or updated to incorporate conceptual knowledge and case studies, projects, and practical assignments that are directly related to SDGs, thus equipping students with a well-balanced combination of theoretical knowledge and practical experience.

The academics are encouraged to conduct and disseminate research that advances the understanding of how tourism can contribute to SDGs, thus further

enriching educational content and providing empirical evidence to support curriculum development. It calls for adopting pedagogical approaches that encourage critical thinking, problem solving, and active learning is recommended. Industry professionals are vital for providing practical insights and opportunities for students to participate in sustainability within the tourism sector. The study strongly suggests that the industry professionals need to be engaged with educational institutions by offering internships, guest lectures, and project partnerships that expose students to sustainable practices and challenges in the industry.

Policymakers are urged to mandate the integration of SDGs into the curriculum and to support inclusion through funding or incentives for institutions that demonstrate innovative approaches to embedding sustainability in their curricula. This study strongly recommends collaboration between universities, industry, and non-governmental organizations to ensure that education is aligned with the tourism sector's current and future sustainability needs.

CONCLUSION

In light of the increasing importance of sustainable development, this study endorses that postgraduate degree programs in tourism, travel, and hospitality management must be aligned with the Sustainable Development Goals (SDGs). A holistic approach and enduring partnerships between academia, industry, and policymakers create an educational ecosystem that fosters sustainability, innovation, and responsible leadership in tourism. The TESDK framework offers a valuable resource for standardizing and future-proofing tourism education, thereby ensuring that it positively contributes to the global goals.

This study acknowledges the limitations of the framework to be indicative and not exhaustive. It demands continuous and timely updates to include the key concepts and skills apt to the concurrent times, owing to the dynamic nature of the tourism industry. The study needs to be extended to all universities offering tourism programs in India to better equip future tourism professionals with the skills required for a harmonious and greener future for all and to align the curriculum to further the cause of SDG inclusion and acceleration.

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Myasthenia Gravis: Mental Health and Treatments, *in silico* Survey of the Compounds

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ABSTRACT

The first introduction of the disease Myasthenia Gravis (MG) was coined by the physician Thomas Willis in the year 1672. Myasthenia Gravis disease is an autoimmune and neuromuscular disease. In particular, it is caused when there are problems related to muscles and the neuromuscular junction (NMJ). Further, conditions such as depression and anxiety disorder also called posttraumatic stress disorder (PTSD) are greatly prevailing in individuals who are suffering from MG disease. Moreover, amongst the MG patients, depression and anxiety is not only higher but also is underdiagnosed. Formerly, the treatments related to the disease were not discovered. Whereas, nowadays, therapeutic diagnosis such as cholinergic transmission enhancement, short term immunotherapy, immunosuppressive agents, and many more are discovered. Interestingly, the patients who got treated with the process of thymectomy and immunosuppressive therapy, their physical health got enhanced and symptoms related to disabilities lowered. Hence, their mental health improved to a great extent. Equally important, *in silico* study using the web server ProTox-II was done and Mycophenolate mofetil drug was found safer comparatively to rest of the compounds that were given to the MG patients. Surprisingly, a monoclonal antibody-Efgartigimod and an antisense oligonucleotide-Monarsen are in the trial phases. In future MG patients will be treated by using efgartigimod and monarsen. Indeed, development is under progress and the disease will be cured in the coming time.

KEYWORDS: *Myasthenia gravis, Autoimmune, Inflammation, Posttraumatic stress disorder.*

INTRODUCTION

Myasthenia Gravis

The first introduction was given by the physician Thomas Willis in the year 1672 regarding the disease myasthenia gravis (MG). MG is a neuromuscular and autoimmune disease. Also, fatigability of skeletal muscles is witnessed. The impairment of transmission of neuro muscles is caused by binding of autoantibody, this takes place either by impairment in the postsynaptic muscle membrane or disorder in normal alignment of muscles. The muscle's acetylcholine receptors (AChRs) are activated and bound by the acetylcholine produced from the axon terminals, which causes the receptor channel to open and the muscular membrane to depolarize. In addition, assembling of AChR is compelled by agrin. The event

of binding of LDL receptor related protein 4 (LRP4) takes place when agrin is secreted from the terminal, causing it to become active and join forces with muscle specific kinase (MuSK), resulting in MuSK's auto phosphorylation and activation. As a result, a signalling cascade that encourages AChR clustering at the NMJ via rapsyn is activated. It has been estimated that approximately 85 percent of the individuals observed the presence of antibodies against the muscle AChR. Also, approximately 6 percent of the people who are suffering from the disease are found having antibodies against MuSK. However, seronegative patients are those who do not have detectable antibodies to the above mentioned antigens, seronegative myasthenia gravis (SNMG). In the MG disease, the event of class switching takes place in AChR. Also, mutation takes place somatically and is of IgG1 class. The

immunoglobulin IgG1 and IgG3 subclasses make up the AChR antibodies. Also, it has the capability to combine divalently to the nearby AChR, and this event takes place on the muscle surface. Moreover, CD4 cells are in the lead role in immunopathogenesis of MG disease. The above mentioned activities are dysregulated. This dysregulation leads to formation of autoantibodies and secretion of pro-inflammatory chemicals. It is found that the identification of AChR specific Th1 and Th17 cells coincides and then defective T cells get produced. Together, T cell responses and thymic in MG patients shows that suppression of T cells does not occur properly. Upon the activation of voltage-gated calcium channels by an action potential, which results in an influx of calcium to the nerve terminal, synaptic vesicles possessing ACh gets secreted through the presynaptic membrane. The enzyme (AChE), which encourages ACh breakdown, modulates the highly quick diffusion time of ACh to the synaptic cleft. The so-called miniature end plate potential (MEPP), produced by the spontaneous secretion of synaptic vesicles, whereas an induced end plate potential gets created when many synaptic vesicles are secreted at a single time in reaction to the stimulation of nerve fibre, in other words depolarization. The myofiber subsequently involves an action potential; hence, leading to tightening. Moreover, spread is made potential as the concentration of ACh secreted into the synapse is constantly higher than what is important to lead to an action potential. On the postsynaptic membrane a localized depolarization as well as the activation of nearby voltage-gated sodium channels occurs at the time of binding of ACh to its receptors. Therefore, this enables the conversion of the chemical response into the action potential of the muscle fibre, an electric signal. The observation of the membrane and the cleft is done through an electron microscope. Interestingly, AChR and C3 antibodies can be observed in the cleft. Nowadays, the treatment is basically from steroids and cytotoxic drugs that show side effects to the body. Also, immunosuppression too occurs. Various researches were conducted that failed, they were cytokine based treatment for MG. The researchers, have found that safe treatments with less side effects can be from the therapies related complement inhibitors. Because of the high reduction in EAMG this method got introduced. Consequently,

various strategies that were used included complement inhibiting recombinant proteins, complement inhibiting complex, soluble isoforms, and many more [1].

Mental health related to myasthenia gravis

What is mental health? Mental health is a term that was coined by Dr. Brock Chisholm the first Director-General of the World Health Organization (WHO) in the year 1854. Furthermore, mental illness necessitates the incidence of disorders related to cognition, affect, and behaviour. Particularly, conditions similar to depression, anxiety disorder also known as posttraumatic stress disorder (PTSD) are very predominant in individuals suffering from myasthenia gravis. Moreover, factors such as stability related to illness and depression have been found as important factors affecting the quality of life. Hence, the above mentioned factors should be taken in regard for the treatment of the MG patients. As yet, the proper treatment related to the mental disorder in MG patients remains insufficient. Furthermore, because the indications of myasthenia gravis are similar to the somatic signs of anxiety and depression, for instance, shortness of breath, facial weakness, and blepharoptosis. Therefore, comorbidities suffering from mental and myasthenia gravis may be misdiagnosed. The mental disorders most common being depression, followed by anxiety is observed in the patients suffering from MG disease when the duration of the disease is longer and is more severe this may lead to the increased rates of depression. Moreover, when there is dysfunction related to respiration, swallowing, and communication this leads to anxiety in MG patients, for early detection and better outcome awareness related to mental disorders to be there in older age groups [2].

Therapeutics strategies

1. Cholinergic transmission enhancement: First line of treatment, and also discovered first for treating MG. It has been found that anticholinesterase prevents enzymatic elimination of acetylcholine. This event leads to increasing the time for postsynaptic membrane and improving neuromuscular transmission. Moreover, anticholinergic provides fractional enhancement to the patient [3].
2. Short term immunotherapy – plasmapheresis: In this process, the blood cells are separated from

plasma that contains pathogenic antibodies, further, it is transferred to the patient. Thereby, the patients which are anti-AChR and anti-MuSK positive its enhancement occurs when reduction in autoantibodies takes place [3].

3. Immunosuppressive agents: Glucocorticoids, azathioprine, cyclosporine, mycophenolate mofetil and others are used. This depends on immunomodulatory treatments [3].

In order to find the toxicity of the drugs regarding its efficiency and efficacy various web servers are used and ProTox-II is one of the technology.

Technology used: ProTox-II

ProTox is a web server for estimating the oral toxicity which is in silico method prediction. According to the U.S. Food and Drug Administration (FDA), early assessment of the drugs is to be done before the consumption of the patients. This tool helps in requirements of risk assessments and regulatory needs. However, these kinds of exposure through food and medicines are harmful so keeping a check on this is always advisable. The main motive is to check the things, giving a warning to restrict the destruction, reducing efforts, and cost. It comprises toxicity, system biology, biostatistics, and computer science. In addition, toxicity of a component is measured on the factors such as mutagenicity, carcinogenicity, hepatotoxicity, and immunotoxicity. Furthermore, its quantity is measured in terms of lethal dose values denoted by LD₅₀. The ProTox website has target knowledge for both chemical and molecular targets. The ProTox-II web server's innovation is that the forecasting system is divided in various categories of toxicity. Thereby, disclosing the potential molecular mechanisms underlying the toxic response. For the purpose of predicting multiple toxicity endpoints, the latest version, ProTox-II, integrates molecular similarity, pharmacophore-based, fragment propensities, most common features, and machine learning models [4].

Through the literature survey, it has been found, that these are the drugs that are used in myasthenia gravis treatment but the ones that have the molecular weight less than 380 are not toxic for consumption. Also, the toxicity class should be higher so that the drug is safe for

use. For example, azathioprine, mycophenolate mofetil, and cyclosporine is better to use as its toxicity class is 4, which is more than the other drugs like methotrexate and tacrolimus.

Table 1: given below describes the drugs whose toxicity have been tested on the web server ProTox-II.

S. No.	Name of the drug	LD ₅₀ value	Toxicity class
1.	Azathioprine	450mg/kg	4
2.	Mycophenolate mofetil	1000mg/kg	4
3.	Cyclosporine	1480mg/kg	4
4.	Methotrexate	3mg/kg	1
5.	Tacrolimus	130mg/kg	3
6.	Cyclophosphamide	94mg/kg	3
7.	Pyridostigmine	119mg/kg	3

The above results of the illustrations 1 through 7 of the drugs are generated by the ProTox-II web server.

Mycophenolate mofetil: Its mechanism follows the de novo pathway whereas other cells follow the salvage pathway. Proliferation of T and B cells are inhibited when mycophenolate blocks de novo pathway. Formation of antibodies is prevented by the B cells. But it does not kill older autoreactive lymphocytes. Hence, the treatments take long time until the auto reactive lymphocytes die. From the recent data, a survey of mycophenolate mofetil enhances the improvement by 70 to 75 percent when used as an adjunctive agent and as immunotherapy. The main advantage is that it is safe to use [5].

SUMMARY

Myasthenia Gravis, is an uncommon autoimmune neuromuscular disorder and the first introduction was given by the physician Thomas Willis in the year 1672. Also, men and women at different ages get affected so a typical patient is either a woman under the age of 38 or a man over the age of 60. Particularly, there is an immunological attack, that is T cell dependent on the postsynaptic membrane. Hence, after this event, destruction in the postsynaptic muscle membrane takes place. Consequently, fatigable muscle weakness occurs when the complex folding of the membrane gets simplified and the density of AChRs decreases. The disease is caused by antibodies namely acetylcholine

receptor, low density lipoprotein receptor related protein 4, and muscle specific kinase. Due to, occurrence of this disease, the patients develop mental illness that comprises depression, anxiety, and many more. Moreover, quality of life has been affected by factors such as stability related to illness and depression. Till date, the proper treatment related to the mental disorder in patients of MG remains insufficient. On the other hand, amongst the MG patients, factors like depression and anxiety not only are higher but also are underdiagnosed. There are various therapeutic strategies for the patients who are suffering from MG disease. Particularly, there are various treatment therapies such as cholinergic transmission enhancement, short term immunotherapy, immunosuppressive agents, and many more. Moreover, toxicity of the drugs is found through various web servers and ProTox-II is one of them. ProTox-II is a web server to estimate the oral toxicity, which is in silico method prediction. According to the U.S. Food and Drug Administration (FDA), early assessment of the drugs is to be done before the consumption of the patients. ProTox-II web server is used to find the toxicity of the drugs that are used and mycophenolate mofetil is found safe with less side effects. Through various other

studies few drugs such as monarsen, rozanolixizumab, and efgartigimod are in the clinical trial phases and will be launched in the medical sector soon.

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