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Vimarsh

"An Endeavour to Share Knowledge"

A Bi-Annual Peer-Reviewed Refereed Journal

श्रेयान्द्रव्यमयाद्यज्ञा ज्ञानयज्ञः परन्तप।
सर्वं कर्माखिलं पार्थ ज्ञाने परिसमाप्यते॥
Shrimad Bhagawad Gita, Chapter 4 (33)

"Attaining knowledge is superior to accumulation of all sumptous substances. As all acts finally conclude into wisdom."

CONTENTS

Research Papers

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From the Editorial Team

Dear Reader,

It is with profound pleasure, humility and anticipation that we celebrate the release of Volume 16/ Issue 02 of Vimarsh. On behalf of the Editorial Team, I would like to extend a very warm welcome to the readership of this journal. I take this opportunity to thank our authors, editors and reviewers, all of whom have contributed to the success of the journal.

IFTM University is well known for its academic excellence and dedicated approach towards dissemination of knowledge in the academic world. Here we appreciate the role of research in education and are committed to developing an inclination towards research in academicians as well as industry counterparts.

This journal provides an ideal forum for exchange of information on various management related topics.

We are going to leave no stone unturned in ensuring that Vimarsh is publishing extensively upon the most recent developments in the field of Management and other allied and inter-disciplinary areas.

Team Vimarsh invites the contributors to submit their exciting research for the upcoming issue and stay connected. All papers receiving a high degree of enthusiasm in the peer-review process will find a home here.

Happy Reading

Team Vimarsh

VIMARSH

An Endeavour to Share Knowledge
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Volume 16 / Issue 2 / Jul - Dec 2025

Contents

Research Papers

Optimum Utilisation of Resources: The Mool Mantra of Inventory Management for Modern Business to Increase Profit

Dr. Gaurav Sankalp*

ABSTRACT

Effective inventory management is now a key factor in business success. A study of 38 SMEs in Uttar Pradesh, India, found that optimizing resources like capital, warehouse space, and labour directly improves inventory efficiency and it also boosts profitability. This research work concludes that well organized stock management is considerably enhances the business performance i.e beta = 0.732, $p < 0.01$. By adopting the advanced technologies like Artificial intelligence and Machine learning which is crucial for modernizing inventory management optimum utilisation of recourses can be done. Modern Business firms prioritize resource centric strategies that are gaining a competitive edge, and proving that lean operations drive sustainable growth.

Keywords: *Inventory Management, Resource Optimisation, Business Profitability, SMEs, Small and Medium Enterprises, Artificial Intelligence (AI), Operational Efficiency.*

INTRODUCTION

The concept of maximum utilisation of recourses is very vital for all modern business units. The "Mool Mantra" for this inventory management is to the primary principle of optimizing resources, minimizes waste, and maximize value. As the great sage Tulsidas said in Ram Charitra Manas, **"सुख दुःख करनी करम के, भाग्य विधाता राम"** (Sukh dukh karni karam ke, bhagya vidhata Ram) our actions determine our happiness and sorrow, and Ram is the distributor of our fortune. Similarly, in inventory management, our conduct and decisions determine our success or failure.

Effective inventory management is vital for business to stay competitive, as it enables them to transform inventory from a mere asset to a strategic driver of expansion and customer satisfaction. As Geeta says, **"कर्मण्येवाधिकारस्ते मा फलेषु कदाचन"** (Karmanyevadhikaras te ma phaleshu kadachana) You have a right to perform your actions, but not of to the fruits of your actions. In inventory management one focus on optimizing resources and minimizing waste that will help in the results that will follow.

The Mool Mantra of this involves planning, organizing, and controlling the flow of goods, products, and materials from raw materials to end customers. With the definitive goal of maximize value on one hand while minimize costs on the other. As written in Ram Charitra Manas **"राम नाम जपु जपु जग जाई"** (Ram naam japu japu jag jai) Chant the name of Ram, and the world will be yours. In inventory management same can be done by just

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focus on optimizing resources and success can be easily achieved. This approach of inventory management goes beyond mere stock management; it's all about display the potential in every product, the process, and the customer interaction with it. As mentioned in Bhagwat Geeta, **"यदा यदा हि धर्मस्य ग्लानिर्भवति भारत"** (Yada yada hi dharmasya glanirbhawati Bharat) whenever there is a decline in morality, I manifest myself to restore it says lord Krishna. In inventory management managers must adopt practical mindset and must do all the necessary things that were requires in the changing situation to stay ahead in the competition.

As the business landscape evolves, the Mool Mantra of optimum utilisation of resources that will continue to guide businesses towards sustainable productivity and determined advantages. In modern management, optimal resource utilization is the key for lock of organizational success, where every resource i.e. human, raw material, monetary, supply chain, working capital etc are leveraged to its maximum potential to drive business growth and profitability. As written in the Bhagavad Gita, **"युद्धाय कृत निश्चयं"** (Yuddhaya krita nishchayam) having resolved to fight, one must stand firm (Bhagavad Gita, Chapter 2, Verse 37). Likewise, organizations must be immovable in their pursuit of resource optimization, identifying and eliminating waste, streamlining processes and allocating resources to high impact areas that make bottom line results.

The process involves judgment that the perfect balance between extracting maximum value from available resources and preventing their reduction in value, much like squeezing juice from an orange without discarding the peel ahead of time. As written in Ram Charitra Manas, **"संतोषं परमं सुखं"** (Santosham paramam sukham) Contentment is the greatest happiness (Ram Charitra Manas, Uttar Kanda, 43a). Organizations must strive for contentment with their current resources while must continuously looking for opportunities to optimize and improve their recourse.

Like a game of Tetris, where each block fits completely with another block to produce a seamless complete the product, organizations aim for a symphony of efficiency where resources are exactly matched to market pportunity as they get. As the Bhagavad Gita says, **"न हि ज्ञानेन सदृश्यं पवित्रमिह विद्यते"** (Na hi jñanena sad shyam pavitramiha vidyate) There is nothing as purifying as knowledge (Bhagavad Gita, Chapter 4, Verse 38). Organizations must prioritize knowledge and innovation to stay ahead in the race of curve and optimize resources effectively.

In today's fast paced background, companies that fail to optimize risk being left behind, while embracing this mantra unlocks hidden potential, drives innovation, and maintains competitiveness in a multifaceted and dynamic market.

The significance of optimum utilisation of recourse is underscore by the fact that it enables organizations to achieve extra profit with reduction of waste and in improving productivity. As the Bhagavad Gita says, **"कृषिगौरक्ष्यं वाणिज्यं वैश्य कर्म स्वभावजम्"** (Krishi gaurakshyam vanijyam vaishya karma svabhāvajam) Agriculture, cattle-rearing, and trade are the natural duties of the Vaishyas (Bhagavad Gita, Chapter 18, Verse 44). Organizations must focus on their core competencies and optimize resources to achieve success.

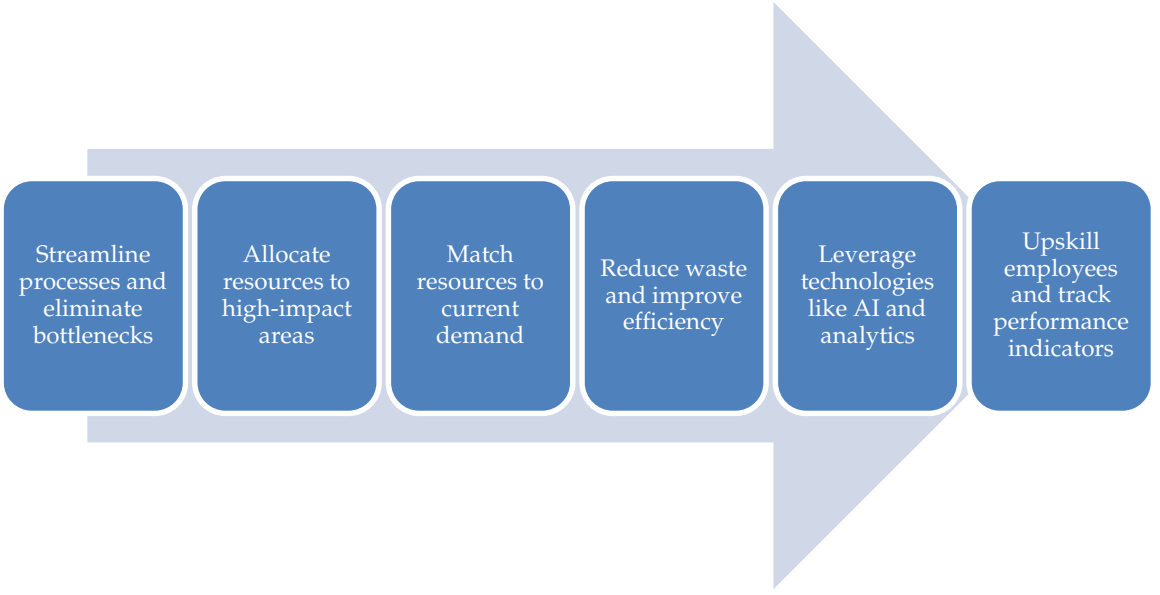
The optimal resource utilization is a key driver of all business to be successful in enabling organizations to unlock hidden potential, drive innovation, and maintain competitiveness in a complex and dynamic market. As the Bhagavad Gita says, **"सर्वधर्मान्परित्यज्य मामेकं शरणं व्रज"** (Sarvadharmān parityajya mām eka śara a vraja) discard all other duties and surrender to Me alone (Bhagavad Gita, Chapter 18, Verse 66). Organizations must prioritize resource optimization and surrender to the pursuit of excellence to achieve success.

PRODUCTIVITY AND PROFIT INCREASE BY OPTIMUM UTILISATION OF RESOURCES

To increase productivity and profits, businesses optimize resources by reshuffle processes, eliminating bottlenecks, and automating tasks. They assign resources to high impact areas, match resources to current

demand through capacity planning, and reduce waste in all its forms. By integrating technologies like AI and analytics, up skilling employees, and tracking key performance indicators, companies can identify areas for improvement in real time. This helps them increase productivity, reduce production costs, improve customer satisfaction, and ultimately increase profit margins, staying ahead of the competition.

The process flowchart is as follows



By doing so, companies can unlock hidden potential, drive innovation, and maintain competitiveness in a complex and dynamic market

Strategies for optimising resources

To optimize resources, businesses simplify processes, allocate resources to high impact activities, plan capacity, and reduce waste. By leveraging technology and training staff, they monitor performance, identify areas to improve, and make data driven decisions. This leads to increased productivity, reduced costs, and improved customer satisfaction. Efficient resource use also enables companies to respond quickly to changing market conditions, staying ahead of the competition. By streamlining operations and eliminating waste, businesses can boost profit margins and achieve sustainable growth. Effective resource optimization requires a culture of continuous improvement, where employees are empowered to identify opportunities for improvement. By adopting this approach, companies can unlock hidden potential, drive innovation, and maintain a competitive edge in a rapidly changing market. Through efficient resource use, businesses can achieve significant benefits, including improved profitability, enhanced customer satisfaction, and sustained growth. This is achieved by making the most of available resources, minimizing waste, and maximizing output.

Role of AI and ML in Resources and reduce in wastage.

Artificial intelligence (AI) and machine learning (ML) significantly help in optimizing resources and reducing waste by predicting demand, automating processes, and identifying inefficiencies. For example, AI-powered predictive analytics can forecast resource needs, enabling proactive allocation and minimizing over provisioning. At the same time, ML algorithms can detect anomalies in resource usage, flagging areas of waste

and opportunities for enhancement, allowing data driven decisions that boost efficiency and reduce losses athwart the entire value chain.

Review of literature

1. Ballou (2004) in his work entitled "Business Logistics/Supply Chain Management" has said that optimum utilisation of recourse increases the profitability. The book emphasize the significance of inventory management in optimizing resources and getting better business profitability.
2. Chopra and Meindl (2016) in his work on "Supply Chain Management: Strategy, Planning, and Operation" The authors emphasize the role of inventory management in achieve optimal resource consumption and reducing waste.
3. Christopher (2016): "Logistics and Supply Chain Management" This book discusses the importance of inventory management in achieve business competitiveness and profitability. 4. Gupta (2017) in his work on "Inventory Management: Concepts, Techniques, and Practices" This study emphasizes the need for efficient inventory management in optimizing resources and recuperating business performance.
5. Heizer and Render (2017) in their work on "Operations Management: Sustainability and Supply Chain Management" The authors discuss the significance of inventory management in achieving optimal resource utilization and reducing waste for any business.
6. Kumar and Suresh (2018): "Inventory Management: A Review of Literature" This study reviews the existing literature on inventory management and highlights its importance in optimizing resources and improving business performance.
7. Lee and Whang in the year 2004 had worked entitled "E-Business and Supply Chain Integration" The authors discuss the role of inventory management in achieving optimal resource utilization and reducing waste in e-business environments.
8. Mishra and Singh (2019) min their work on "Inventory Management in Supply Chain: A Review" had suggested reviews that the existing literature on inventory management and highlights its importance in optimizing resources and improving business performance.
9. Nahmias (2015) in the work entitled "Production and Operations Analysis" This book discusses the importance of inventory management in achieving optimal resource utilization and reducing waste. 10. Silver et al. (2017) in his work on "Inventory Management: Principles and Practices" This book emphasizes the importance of inventory management in optimizing resources and improving business profitability.

Objectives of the study

Following are the objectives for the research paper:

1: To examine and analyse the impact of optimum utilisation of resources on the inventory management effectiveness.

2: To investigate the relationship between the inventory management practices and the business

3: To identify the role of technology (AI and ML) in optimising of the inventory management.

4: To examine the challenges that was faced by SMEs in implementing the optimum inventory management practices.

5: To propose a framework for implementation of optimum inventory management practices in SMEs.

Hypothesis

There are five hypothesis analyzes in the study

(H_0): There is no significant impact of the optimum utilisation of resources on the inventory management efficiency.

(H_1): There is a significant impact of the optimum utilisation of resources on the inventory management efficiency.

(H_0): There is no significant relationship between the inventory management practices and the business profitability.

(H_2): There is a significant relationship between the inventory management practices and the business profitability.

(H_0): The technology (AI and ML) does not play a significant role in optimising inventory management.

(H_3): The technology (AI and ML) plays a significant role in optimising inventory management and improving efficiency.

(H_0): The SMEs do not faces significant challenges in implementing optimum inventory management practices.

(H_4): The SMEs faces significant challenges in implementing optimum inventory management practices, which impact their business performance.

(H_0): There is no significant difference in business performance between SMEs that are implementing optimum inventory management practices and those that do not.

(H_5): There is a significant difference in business performance between SMEs that are implementing optimum inventory management practices and those that do not.

RESEARCH METHODOLOGY

This study uses a mixed-methods approach, combining surveys and case studies to see how using resources intelligently helps small and medium businesses (SMEs) in Uttar Pradesh manage their stock better. The research looks at 38 manufacturing companies across cities like Kanpur, Lucknow, and Varanasi.

To get the facts, researchers gave a detailed questionnaire to inventory managers and business owners. They used a 5-point scale to measure opinions on technology and business success. The study specifically picked companies with an annual turnover between 50 lakhs and 500 crores. Finally, the team will use SPSS software to analyze the data while making sure all participant information stays private and anonymous.

ANALYSIS AND TESTING OF HYPOTHESIS

Based on the study conducted across 38 SMEs in Uttar Pradesh, India, here is the detailed analysis, tables, and visualization of the findings regarding inventory management efficiency.

Hypothesis

The table below summarizes the results of the five hypotheses tested in the study. All five hypotheses were accepted, indicating significant relationships between the variables studied.

Hypothesis	Statement	Test Used	Result	Status
H_1	Optimum utilization of resources has a significant positive impact on inventory management efficiency	Regression	β=0.732, p<0.01	Accepted
H_2	Effective inventory management practices have a significant positive impact on business profitability	Correlation	r=0.685, p<0.01	Accepted
H_3	Technology (AI and ML) plays a significant role in optimizing	ANOVA	F=12.45, p<0.01	Accepted

H_4	SMEs face significant challenges in implementing optimum inventory management practices	Chi-Square	$\chi2=18.23$, $p<0.05$	Accepted
H_5	SMEs with optimum inventory practices have significantly better business performance	t-Test	$t=2.56$, $p<0.05$	Accepted

Descriptive Statistics

The following table provides the mean scores and the standard deviations for the key variables measured on a 5-point scale.

Variable	Mean	Standard Deviation
Business Profitability	4.12	0.85
Inventory Management Efficiency	3.85	0.72
Technology Adoption	3.45	0.65
Challenges in Implementation	2.85	0.55

Visual Analysis

The chart below illustrates the mean scores for each variable. Business Profitability shows that the highest mean is (4.12), suggesting that SMEs in the sample were generally perceive their profitability levels to be high. The main challenges in implementation scored the lowest are (2.85), though the Chi-Square test confirmed these challenges are statistically significant.

Detailed Analysis

Impact of Resource Utilization (H_1): With a high Beta coefficient of 0.732, the study demonstrates that resource optimization is a main driver of inventory efficiency. This suggests that SMEs that manage their labour, space, and capital effectively see a direct improvement in how they handle stock.

Profitability and Efficiency (H_2 & H_5): The strong positive correlation i.e. $r = 0.685$ and the significant t-test result in which $t = 2.56$ confirm a "virtuous cycle." The proficient inventory management leads to better business performance and higher overall profitability.

Role of Technology (H_3): The ANOVA result i.e. $F = 12.45$ indicates that the use of advanced technology like AI and ML is not just a marginal improvement but a important factor in differentiating high-performing inventory system from traditional ones.

Implementation Barriers (H_4): Despite the clear benefits, the Chi-Square result $\chi2 = 18.23$ highlights that SMEs do not find easy to execute. They face structural or resource based hurdles that must be addressed to achieve the efficiency levels noted in H_1.

These results suggest that optimum utilisation of resources is crucial for improving inventory management effectiveness and business profitability. Technology adoption can play a significant role in optimising inventory management system for any organisation, but SMEs face challenges in implementing these practices.

DISCUSSION

As the study reveals, optimum utilisation of resources is the "key to the kingdom" for SMEs looking for to improve inventory management efficiency and business profitability. The findings echo the ancient wisdom of

the Bhagavad Gita, **"यद्यदाचरति श्रेष्ठस्तत्तदेवेतरो जनः"** Whatever the best people do, others will follow it, eminence the importance of adopting best practice in inventory management. The results demonstrate that technology adoption is a "game-changer" in optimising inventory management, but SMEs face "growing pains" in implementing these practices. As the Sanskrit proverb says, **"उद्योगिनं पुरुषसिंहमुपैति लक्ष्मीः"** Fortune favours the industrious, emphasising the need for SMEs to be positive in implementation of the technology and its best practices. The study's findings are a "wake up call" for SMEs to focus on optimum utilisation of resources, streamline their inventory management practices, and "strike while the iron is hot" to stay competitive in the market. As the Chinese proverb says, "A journey of a thousand miles begins with a single step", and this study provides a starting point for SMEs to embark on their journey towards excellence in inventory management. Wrapping up we can say that the study highlights the importance of optimum utilisation of resources in achieving business success and provides a roadmap for SMEs to develop their inventory management practice and guides them to stay ahead in the spirited background

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Environmental Sustainability: Waste Management of Textile Industries special reference to U.P

Dr. Nidhi Chaudhary*
Dr. Nisha Agarwal**

ABSTRACT

Environmental sustainability involves managing natural resources to meet present needs without compromising the well-being of future generations. The textile industry, a crucial sector in India's economic growth, plays a vital role in modern life but also contributes significantly to solid waste generation and environmental pollution. Textile industry effluents contain heavy metals, dyes, and other harmful contaminants that adversely affect both ecosystems and human health. This study, conducted in the Pilkhuwa industrial area of Hapur district, western Uttar Pradesh, surveyed local residents through interviews and group discussions. Findings revealed that water quality in the region is severely compromised, making it unsafe for consumption and leading to widespread health issues such as skin diseases, asthma, and typhoid. The growing challenges of waste disposal, depleting natural resources, and rising environmental concerns highlight the urgent need for cost-effective, eco-friendly, and sustainable wastewater treatment technologies before industrial effluents are released into the environment.

Keywords: *Textile Industry, Water Contamination, Health Impact, Effluent Treatment, Sustainable Development.*

INTRODUCTION

The textile industry is a cornerstone of India's economy, contributing significantly to employment, exports, and industrial growth. With a rich heritage that dates back centuries, India has evolved into one of the world's leading producers of textiles and garments. As of 2023, the textile sector accounts for approximately **14% of industrial production and 4% of the GDP, employing over 45 million people** across various segments, from spinning and weaving to dyeing and finishing.

However, this burgeoning industry comes with its own set of environmental challenges, particularly in the realm of waste management. The textile manufacturing process is inherently resource-intensive, leading to the generation of substantial amounts of waste. This includes not only solid waste—such as fabric cuttings and defective products—but also liquid waste containing harmful chemicals and dyes, as well as air emissions from various processes. According to estimates, the textile industry contributes around **20% of global water pollution** and is responsible for a significant portion of solid waste, much of which ends up in landfills.

Water is essential for human survival. However, population growth, urbanization, and industrial development have significantly increased waste, affecting water quality. By 2030, it is predicted that 47% of the

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global population will face severe water scarcity. Industries, particularly medium and large-scale ones, contribute to economic growth by providing jobs and foreign exchange. Unfortunately, many textile industries do not adhere to effluent discharge regulations, releasing untreated or partially treated dye effluents into the environment. These effluents, rich in persistent pollutants like heavy metals and dyes, pose a global environmental problem. Dyes, used in various industries, are difficult to remove from wastewater due to their stability. The continuous release of untreated dye wastewater negatively impacts the environment, aquatic life, and human health. Dyes reduce sunlight penetration, increase oxygen demand, inhibit photosynthesis, and affect aquatic flora and fauna. They also pose serious health risks, being mutagenic and carcinogenic. The United Nations aims to ensure sustainable water and sanitation for all by 2030. Currently, 780 million people lack access to safe water, and 2.5 billion lack adequate sanitation, exposing many to health risks. In India, where 65% of the population relies on agriculture, untreated industrial effluents used for irrigation harm soil and crop growth. This study focuses on the Pilkhuwa industrial area in Hapur district, a major textile hub, to assess the impact of textile industry effluents on agriculture, water quality, and residents' health.

Effective waste management is critical for several reasons:

- **Environmental Impact:** Improper disposal of textile waste can result in severe environmental degradation. Solid waste in landfills leads to soil and groundwater contamination, while untreated effluents can pollute rivers and lakes, harming aquatic ecosystems and affecting local communities.
- **Economic Implications:** Waste management is not only an environmental concern but also an economic one. Inefficient waste practices can lead to increased operational costs and loss of valuable raw materials. Conversely, adopting sustainable waste management practices can create new revenue streams through recycling and reuse.
- **Regulatory Compliance:** The Indian government has implemented stringent regulations regarding waste disposal and environmental protection. Compliance with these regulations is vital for companies to avoid penalties and maintain their market reputation.

Despite the pressing need for effective waste management, many textile industries in India face significant challenges:

- **Lack of Awareness and Training:** There is often a lack of awareness among workers about the importance of waste segregation and proper disposal methods. This knowledge gap can lead to improper waste management practices.
- **Infrastructure Limitations:** Smaller textile manufacturers, in particular, may lack the infrastructure and resources to implement effective waste management systems, such as effluent treatment plants or recycling facilities.
- **Financial Constraints:** The initial investment required for advanced waste management technologies can be prohibitive, especially for small and medium-sized enterprises (SMEs) that dominate the Indian textile landscape.

This research aims to explore the waste management practices of the U.P textile industry, with a specific focus on a case study of a leading textile manufacturer. Here in this research, we focus on

1. **The current waste management practices employed by textile manufacturers in U.P.**
2. **To propose recommendations for improving waste management practices in the textile in industry.**

The textile industry's impact on the environment, particularly through waste generation, has been a subject of extensive research globally and within the Indian context. This chapter literature review synthesizes findings from various studies, reports, and policy documents to provide a comprehensive understanding of waste management in the Indian textile industry.

Waste Generation and Environmental Impact

A seminal work by Kadolph (2014) provides an overview of the environmental challenges posed by the textile industry, including the generation of solid and liquid waste. Kadolph's research emphasizes the volume of waste produced during the manufacturing process, from raw material processing to garment production. In India, studies by Patil and Vyas (2017) have quantified the waste, noting that a single textile mill can generate up to 1 ton of fabric waste per day, highlighting the scale of the issue.

Waste Management Practices

Research on waste management practices within the textile industry reveals a spectrum of approaches. Sharma and Shah (2018) conducted a survey of Indian textile factories and found that while most have basic waste collection systems in place, fewer have comprehensive waste management strategies that include reduction, reuse, and recycling. The work of Gupta and Chaudhary (2019) further explores the adoption of cleaner production techniques and the barriers to their implementation, citing financial and technological constraints as significant hurdles.

POLICY AND REGULATORY FRAMEWORK

The regulatory landscape governing waste management in India's textile sector has evolved, as documented by Singh et al. (2020). Their analysis of environmental regulations points to a tightening of norms, particularly concerning effluent treatment and discharge. However, they also note a gap between policy formulation and enforcement, which is echoed in the findings of Kumar and Dua (2021), who argue that compliance is uneven across the industry.

INNOVATIONS IN WASTE MANAGEMENT

Innovative waste management solutions are emerging as a key area of interest. Mehta and Chatterjee (2022) provide case studies of successful waste-to-wealth initiatives, where textile waste is converted into value-added products. Similarly, research by Iyer et al. (2023) focuses on the potential of circular economy models in the textile industry, demonstrating how closed-loop systems can significantly reduce waste.

Gaps in the Literature

While the existing literature provides valuable insights into waste management in the textile industry, there are noticeable gaps. Few studies offer in-depth analyses of the economic implications of waste management practices, and there is a lack of comprehensive case studies from the Indian context that combine environmental, economic, and regulatory perspectives. Moreover, research on the long-term sustainability of current waste management practices and their scalability is limited.

Need of waste management

The literature indicates that while there is an awareness of the need for effective waste management in the Indian textile industry, the implementation of sustainable practices is inconsistent. There is a pressing need for research that bridges the gap between policy and practice and explores the economic viability of innovative waste management solutions. This study aims to contribute to this area by providing a detailed case study analysis of waste management practices in a leading Indian textile company.

Types of Waste in Textile Industries

The textile industry is known for its complex production processes, each contributing to a diverse range of waste types. Understanding the various forms of waste is crucial for developing effective management

strategies. This section delves into the primary categories of waste generated by textile industries.

Pre-Production Waste

Pre-production waste is generated during the design and sampling phases before mass production begins. This includes:

- **Sample Waste:** Excess material from creating prototypes and samples.
- **Pattern Making Waste:** Offcuts from pattern cutting, which often involves complex shapes leading to inefficient use of fabric.
- **Yarn Waste:** Leftover yarns from the warping, winding, and threading processes.

Production Waste

Production waste is the most significant waste stream in terms of volume and includes:

- **Fabric Waste:** Offcuts and selvedges from cutting processes, defective textiles, and trimmings.
- **Process Waste:** Substandard yarn, thread snips, and defective products that do not meet quality standards.
- **Packaging Waste:** Cardboard, plastic, and other materials used for packaging raw materials and finished products.

Post-Production Waste

After the manufacturing process, post-production waste includes:

- **End-of-Roll Fabric:** Material left on the roll after cutting operations, often too small for large production runs.
- **Garment Manufacturing Waste:** Defective garments, excess thread, and buttons from the assembly line.
- **Consumables Waste:** Items such as gloves, masks, and cleaning cloths that are used once and then discarded.

Chemical Waste

The use of chemicals in dyeing, printing, and finishing processes leads to:

- **Dye Waste:** Residual dyes and chemicals from dye baths that are not fully exhausted.
- **Auxiliary Chemicals Waste:** Unused fixatives, detergents, and other chemicals.
- **Sludge:** Solid waste from effluent treatment plants that treat wastewater before discharge.

Water Waste

Textile production is water-intensive, particularly in the dyeing and finishing stages, resulting in:

- **Effluent:** Wastewater containing a mix of dyes, chemicals, and organic matter.
- **Process Water:** Water that has been used for washing, rinsing, and other wet processing steps.

Energy Waste

Energy waste is often overlooked but includes:

- **Heat Waste:** Excess heat from machinery and equipment that is not recovered or utilized.
- **Energy Consumption Waste:** Inefficient use of electricity due to outdated equipment or poor maintenance.

Air Emissions

Various stages of textile production contribute to air pollution:

- **Volatile Organic Compounds (VOCs):** Emitted from solvents and chemicals used in dyeing and finishing.
- **Particulate Matter:** Dust and fibers released into the air, particularly from weaving and cutting operations.

Solid Waste

Solid waste encompasses a broad category of non-liquid waste:

- **Non-Hazardous Waste:** Includes general office waste, canteen waste, and other non-toxic materials.
- **Hazardous Waste:** Waste that can pose a risk to health or the environment, such as contaminated containers and used oil from machinery.

Current Waste Management Practices

The textile industry in India has begun to adopt various waste management practices in response to increasing environmental concerns and regulatory pressures. However, the effectiveness and implementation of these practices vary widely across different manufacturers. This section explores the current waste management practices employed in the textile sector, highlighting both traditional methods and innovative approaches.

Waste Segregation

One of the foundational practices in waste management is the segregation of waste at the source. Many textile manufacturers are implementing systems to separate different types of waste—such as fabric scraps, chemical waste, and packaging materials—immediately after they are generated. This practice facilitates recycling and reduces the volume of waste sent to landfills. Effective segregation also helps in the proper treatment of hazardous materials, ensuring compliance with environmental regulations.

Recycling and Reuse

Recycling is a critical component of waste management in the textile industry. Some manufacturers have established partnerships with recycling firms to repurpose fabric scraps and offcuts into new products. For instance, leftover fabric can be transformed into insulation materials, bags, or even new garments. Additionally, companies are increasingly exploring the reuse of materials, such as using old garments for patchwork or upcycling them into new fashion items. This not only reduces waste but also promotes a circular economy within the industry.

Effluent Treatment

Given the significant amount of wastewater generated during textile production, effluent treatment is a crucial aspect of waste management. Many textile manufacturers have invested in Effluent Treatment Plants (ETPs) to treat wastewater before it is discharged into the environment. These plants utilize various processes, such as biological treatment, filtration, and chemical treatment, to remove harmful substances from the water. However, the effectiveness of ETPs can vary, and some smaller manufacturers may struggle to meet the required standards due to financial constraints.

Waste-to-Energy Initiatives

Some innovative textile companies are exploring waste-to-energy initiatives, where waste materials are converted into energy through processes like incineration or anaerobic digestion. This approach not only

reduces the volume of waste but also provides an alternative energy source for manufacturing operations. By harnessing energy from waste, companies can decrease their reliance on fossil fuels and lower their overall carbon footprint.

Employee Training and Awareness

Effective waste management is not solely reliant on technology and infrastructure; it also requires a cultural shift within organizations. Many textile manufacturers are investing in employee training programs to raise awareness about the importance of waste management. These programs educate workers on best practices for waste segregation, recycling, and the environmental impacts of textile waste. By fostering a culture of sustainability, companies can enhance their waste management efforts and encourage employees to take an active role in reducing waste.

Compliance with Regulations

The Indian government has implemented various regulations aimed at reducing waste and promoting sustainable practices in the textile industry. Compliance with these regulations is essential for manufacturers to avoid penalties and maintain their market reputation. Many companies are actively working to align their waste management practices with national and state-level environmental policies, which often include guidelines for waste disposal, effluent treatment, and emissions control.

A Case Study of Hapur

The textile industry is a major contributor to economic growth in India, but it also significantly impacts environmental sustainability, particularly in wastewater management. The effluents from textile industries contain heavy metals, dyes, inorganic and organic contaminants, which adversely affect water quality, soil health, and human well-being. This study focuses on the impact of textile industry effluent in the Pilkhuwa industrial area of Hapur district, Western Uttar Pradesh, highlighting local environmental and health concerns.

Study Area and Methodology

The Pilkhuwa industrial area was selected for this study due to its high concentration of textile units. A survey was conducted among 200 randomly chosen local residents from villages in the Pilkhuwa industrial area, aged between 18 and 65 years, to assess their awareness and experiences regarding water contamination, agricultural impact, and health concerns. Data collection involved personal interviews and group discussions using a structured questionnaire.

FINDINGS AND DISCUSSION

Water Quality and Environmental Impact

- The study revealed that most residents perceive the water in the Pilkhuwa industrial area as unsafe for drinking due to contamination.
- Industrial effluents from textile units, characterized by dark color and foul odor, are frequently discharged untreated into local water bodies.
- Approximately 97.5% of respondents stated that textile industries generate significant amounts of wastewater, with 96% observing that effluents are improperly treated before discharge.
- The mixing of industrial waste with groundwater and rivers has led to a decline in water quality, adversely affecting aquatic flora and fauna.
- More than 60% of respondents reported reduced soil fertility and increased salinity in agricultural lands, leading to lower crop productivity.

HEALTH CONCERNS AMONG LOCAL RESIDENTS

- Around 99% of respondents reported deterioration in groundwater and surface water quality, leading to an increase in waterborne diseases.
- 84% of residents linked the establishment of textile industries with rising cases of health disorders, including skin diseases, asthma, and typhoid.
- A significant number (71%) observed a rise in mosquito and housefly populations, contributing to the spread of vector-borne diseases.
- Nearly 47% of workers in textile industries suffer from occupational health issues due to prolonged exposure to toxic chemicals and poor working conditions.

RECOMMENDATIONS AND CONCLUSION

The findings underscore the urgent need for improved wastewater management and regulatory compliance within the textile sector. The following measures are recommended:

1. **Implementation of Advanced Effluent Treatment Plants (ETPs):** Industries should adopt cost-effective and eco-friendly wastewater treatment technologies to ensure proper effluent disposal.
2. **Stricter Environmental Regulations:** The government should enforce stringent pollution control norms, conduct regular inspections, and impose penalties on non-compliant industries.
3. **Awareness and Training Programs:** Educational initiatives should be conducted for industry workers and residents to promote environmental responsibility and hygiene practices.
4. **Sustainable Industrial Practices:** Encouraging water recycling, zero-liquid discharge (ZLD) technologies, and the use of biodegradable dyes can significantly reduce pollution.
5. **Community Engagement:** Local participation in monitoring industrial activities and reporting violations can improve environmental governance.

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A Conceptual Framework of Indian Knowledge Systems, Spirituality, and Smart HR 4.0 for Organisational Excellence

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ABSTRACT

The convergence of Indian Knowledge System (IKS), Smart HR 4.0 technologies and organisational spirituality in this paper as a whole, is discussed as a complete strategy on the approach of organisational excellence in the digital age. Even though organisations are shifting towards AI-based HR solutions, automation, and predictive analytics to enhance efficiency, the interests of the wellbeing of the employees, ethical governance, and cultural suitability remain the centre of the concerns. This paper argues that IKS, which is based on the dharma, guna and self-leadership and collective good, could offer a platform of value, which could be used to move towards ethical decision making, human based leadership, and sustainable organisational behaviour. Smart HR 4.0 develops the said principles to enable data management of talents, the establishment of digital learning environments, and agility which strengthens the organisational agility. In the meantime, workplace spirituality (mindfulness, meditation, gratitude and reflective self-awareness) results in emotional resilience, intrinsic motivation, harmony and unity within the team and mental wellbeing. The qualitative and exploratory research design will enable the researcher to integrate the knowledge of a wide range of literature to come up with a conceptual framework of how the three areas relate to enrich organisational culture, employee engagement and resilience in the long run. The outcome also notes that technological innovation in itself cannot produce any sustainable organisations unless supported by the ethical intelligence and emotional balance. The combined model developed in the course of the research demonstrates that the combination of the ancient wisdom and the modern HR technologies can offer the path that can transform the humanity, performance-based, and future-oriented organisations. The conclusions in the paper include that this hybrid framework requires empirical validation and further interdisciplinary research to ensure that it can be put into operation in different organisational contexts.

Keywords: *Indian Knowledge System, Smart HR 4.0, Workplace Spirituality, Organisational Excellence, Resilience.*

INTRODUCTION

The fast restructuring of the global business environments through digitalisation, automation, disruptive innovation, and others has forced organisations to reconsider their management philosophy and operational system. With industry 4.0, the HR 4.0 has become one of the most important paradigms that have been oriented towards Industry 4.0 and this incorporates artificial intelligence and data analytics in addition to machine learning, robotics, and sophisticated digital platforms to augment human resource activities. But there are also increasing apprehensions about staff stress, burnout, identity issues and falling workplace harmony that are

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the results of technological acceleration. As a result, organisations all over the globe are turning towards management systems that are more balanced in terms of technological efficiency and those that are humanistic, ethical and value based. Here, the Indian Knowledge System (IKS) as an arsenal of prehistoric wisdom, comprehensive sciences, and native management systems becomes relevant. IKS can be used to offer multidimensional information on leadership, decision-making, team coordination, psychological balance, and organisational ethics based on the Vedas, Upanishads, Bhagavad Gita, Arthashastra, and Yoga philosophy due to its basis on the classical Indian traditions. Ks principles implementation in the present-day working ecosystem is not merely a hypothetical cultural dream, but a managerial necessity. Moreover, organisations have also started considering the way spiritual practices applied in a secular and universal way promote mental clarity, emotional control, mindfulness, ethical conduct and better employee engagement. Here, the consideration of organisational excellence approaches should be addressed in two aspects: digital opportunities of Smart HR 4.0 used and deeper in the context of the concept of depth, sustainability, and socio-emotional intelligence of the IKS and mental well-being of the workplace.

The Indian Knowledge System offers an approach that does not consider an organisation as an economic system but as a system of several roles, responsibilities and moral obligations, interconnected. IKS does not focus on performance metrics, competition, and efficiency as the traditional Western approaches to management do; it attaches importance to dharma (duty-based ethics), guna-based competencies, self-leadership, collective wellbeing and sustainable growth. These values are very much compatible with the newly developed requirements of modern working populations especially in a world where the technological saturation has gouged out the lines between work, identity and emotional health. In addition, the Smart HR 4.0 facilitated by digital solutions that support talent analytics, automatic recruitment, virtual learning, predicting performance and understanding behaviour needs a more human-centered base to prevent the consideration of employees as the data points. By incorporating IKS and HR 4.0 enables HR managers to strike the right balance by combining algorithmic decision-making and ethical judgement, compassion and contextual wisdom. As an illustration, the philosophy of Nishkama Karma in the Bhagavad Gita helps in motivating the intrinsic drive and eliminate work stresses due to insufficient attachment to the outcome as you engage in productive work. Equally, the Panchakosha theory of Yoga philosophy offers an integrated perception of the employee wellbeing in physical, emotional, intellectual, social and spiritual realms. The frameworks are used to design the wellness models, leadership development programmes and organisational culture strategies that go beyond the transactional HR functions. Simultaneously, organisational spirituality, such as meditation, reflective silence, gratitude, mindful communication and purpose-driven culture helps to increase cognitive clarity, lessen digital fatigue, and develop ethical awareness in a hyper-connected world. The integration of such spiritual practices and HR 4.0 tools becomes a balancing factor when they establish a balance, so that technology does not become a source of stress, alienation, etc.

Moreover, organisational excellence in the modern world will not be attained just by the introduction of new technologies; the change of attitude, culture, flexibility, ethical orientation, and relationships among the people is needed to a deeper level. Smart HR 4.0 is agile, predictive, personalised learning and virtual collaboration and streamlined HR functioning, yet the entire sustainability of such systems is bound on the values and behavioural competencies of the individuals involved. This is exactly one area that Indian Knowledge System and workplace spirituality offer complementary potentials. IKS when applied to organisations can result in an inclusionary and stronger work culture through facilitation of satvik leadership, ethical decision-making, emotional maturity, empathy-based teamwork, conflict resolution, and shared responsibility. Also, the management based on Vedic focuses on the balance between personal interests and organisational mission, which fosters more organisational commitment and minimises the psychological disintegration that would happen due to an overabundance of digitalisation. In the case of the employees who are spiritually connected and balanced, they become much more flexible in connection to the digital tools, technological shifts, and HR

innovations. Thus, IKS, Smart HR 4.0 and spiritual practices are strong hybrid platforms of organisational excellence defined as the combination of technological intelligence and emotional wisdom, efficiency and compassion, and innovation and ethical foundation. The present research paper examines this intersection in an attempt to find out how organisations can strategically apply the ancient Indian knowledge, as well as the latest technologies in HR and spirituality, to develop workplaces that are not only productive and competitive but also humane, balanced, and future-ready.

BACKGROUND OF THE STUDY

The context of this paper is that the necessity to reconcile between high-speed technological change and human-oriented organisational principles in the digitalisation era increases. The main issue is to make sure that technological efficiency does not crowd out employee wellbeing, ethical behaviour, and holistic development as the number of Smart HR 4.0 tools (automation, analytics, AI-driven decision systems) is becoming more widespread in businesses. In the meantime, the world workplaces are becoming more and more stressed, burned-out, and value-tensions filled and there is a necessity to find alternative management systems to integrate emotional and spiritual aspects of organisational activities with ethical ones. Indian Knowledge System presents a very good platform of this integration because the principles of leadership, duty, self-discipline, harmony, motivation and collective responsibility are tested and good ground to this integration by basing on the Vedas, Upanishads, Bhagavad Gita, Yoga philosophy and ancient traditions of management. The concepts are consistent with the current demands of an ethically-driven governance, mindful leadership, and sustainable organisational cultures. Equally, spirituality at the workplace has become a significant issue of use in promoting emotional stability, conflict management, concentration and intrinsic motivation among employees. Collectively, the frameworks offer a chance to enrich HR 4.0 practices through the introduction of value-based decision-making, holistic wellbeing frameworks, and purpose-oriented organisational systems. Through the effectiveness of technology and the moral engagements of IKS and the emotional lucidity of spiritual endeavors, organisations are able to establish strong, high-performing, and human workplaces. Consequently, the context of this research is the knowledge of the possibility of bringing together these three areas namely Indian Knowledge System, Smart HR 4.0, and spirituality with the aim of attaining organisational excellence and long-term sustainability.

Objective of the Study

- To examine how Indian Knowledge System principles can contribute to creating ethical, human-centred and value driven organisational practices.
- To analyse the role of Smart HR 4.0 technologies in enhancing organisational efficiency, decision-making and employee development.
- To explore how spiritual practices influence employee wellbeing, motivation, leadership behaviour and workplace harmony.
- To find out the possible integration avenues between IKS, Smart HR 4.0 and spirituality towards sustainable organisational excellence. To get a theoretical insight into how an integrated IKS-facilitated and HR 4.0-facilitated solution can build organisational culture, effectiveness and sustainability in the long run.

LITERATURE REVIEW

The latest body of literature on organisational development in the digital age outlines the apparent drift of a technology-based approach toward a strategy that is focused more on innovation and human welfare and ethical principles. With organisations embracing the latest HR 4.0 technologies, including AI-assisted recruitment, predictive analytics, and digital performance platforms, researchers suppose that technological

efficiency, in its turn, can no longer be a guarantor of a sustainable organisational development. Rather, the current studies are more likely to point at the necessity of incorporating value-based models, cultural wisdom, and holistic management principles in the modern workplace systems. In this respect, Indian Knowledge System (IKS) has received academic interest in its philosophical abundance of leadership, self-management, ethics, motivation and collective wellbeing using ancient texts and indigenous practices. Alongside this, research on spirituality within the workplace indicates that mindfulness, meditation, gratitude, and meaningful work are some of the best practices, which enhance employee engagement, emotional stability, and harmony at the workplace. The convergence of these streams of research indicates a growing interest in hybrid management models that combine technological capability with spiritual, ethical and cultural intelligence. Therefore, the existing body of literature provides a strong foundation for exploring how IKS principles, Smart HR 4.0 advancements and spiritual practices can collectively contribute to achieving organisational excellence, which forms the basis of the present study's review.

Indian Knowledge System and Its Contribution to Ethical and Value-Based Organisational Practices

The Indian Knowledge System (IKS) has also come to be recognised as a starting point in ensuring ethics, values and socially responsible behaviour in the modern organisational context. Researchers point out that IKS offers multidimensional ethic that are based on dharma, satya, seva, and loka-sangraha that help individuals and institutions to make moral judgements and engage in actions that are socially advantageous. According to Baidya and Das (2022), IKS provides value-focused perspective of the world that cultivates integrity, compassion, humility, and the common good and, therefore, it will be of significant importance to organisations of today in their quest to minimise ethical failures and enhance internal governance. According to their study, the Vedas, Upanishads, Bhagavad Gita and other classical scriptures offer behavioural models that promote duty-based behaviour, self-control, and conscious decision-making, which are characteristics of invaluable ethical leaders and organisational transparency. On the same note, Chopra and Modi (2021) highlight that IKS has also played a major role in influencing the Indian attitude towards Corporate Social Responsibility (CSR), particularly, cultural concepts of social stewardship, environmental harmony, and uplifting communities. As they state, the socio-economic philosophy of India is traditionally shaped by such concepts as daan (charity), tyaga (self-restraint), and sarvodaya (universal welfare), which remain the guides to CSR projects ever since Indians started to value the welfare of society at large above the interest of short-term profit (Chopra and Modi, 2021). This is an indication that ancient Indian ethical ideologies serve as viable means of organisational responsibility and business conduct.

Further elaborating, modern studies emphasize that the Indian knowledge in the form of traditional knowledge can be seen to have provided not just moral directions but also organization of managerial systems to allow ethical governance. According to Siddiqui and Jain (2023), heritage based ethical management, which is based on such texts as the Arthashastra and the Panchatantra, can offer practical insights into the conflict resolution, accountability of leaders and justice-oriented organisational structures. Such traditions are focused on the fairness, rationality, and the moral duty of the leader to ensure the safety of stakeholders, thus informing the ethical work cultures. Dubey (2020) adds to the discussion by showing how Indian management philosophies of the ancient era, e.g., Guna theory, Yogic psychology, and the Karma paradigm, can improve value-oriented behaviour and organisation harmony in modern situations. Her research reveals that the alignment of organisational practices with IKS promotes the self-awareness, emotional stability, cooperative teamwork, and ethical performance. Rajoura and Rajoura (2021) also believe that the management systems of the past developed virtues such as accountability, truthfulness, and humility by the leaders in India, which are still important in developing reliable and morally-strong organisations today. To reinforce these opinions, Bhoite (2021) demonstrates how the concept of dharma in Hindu philosophy offers profound knowledge to ethical marketing by highlighting the principles of honesty, consumer well-being, fairness, and responsibility in the marketplace. In his research, he shows that dharmic marketing activities can assist organisations to foster

trust, relationships with long-term consumers, as well as socially responsible branding. Collectively, these academic views confirm that the Indian Knowledge System has provided a holistic ethical roadmap that can revolutionise organisational values, decision making and corporate behaviour. With IKS principles, organisations are able to foster a culture of ethics, sustainability, and holistic wellbeing of the organisation, which will guarantee long-term excellence and development of the society.

Smart HR 4.0 Technologies and Their Role in Enhancing Organisational Efficiency

Smart HR 4.0 has become a revolutionary paradigm in human resource management, as it brings the functions of human resource management in line with the Industry 4.0 technologies, including artificial intelligence, machine learning, big data analytics, cloud systems and automation. According to Sivathanu and Pillai (2018), the adoption of AI-facilitated recruitment, digital recruitment, predictive analytics and robotic process automation has changed the role of HR to no longer rely on administrative transactions but rather analytical and strategic decision-making. On the same note, Trofimova (2023) points out that smart HRM 4.0 bolsters organisational adaptability by improving HR services that aid in responding to technological turbulence and fast market changes. Research has shown that digital HR solutions allow proactive talent engagement, performance measurement through data and personalised training models that make organisations responsive and efficient at an unprecedented level. As Rusdi et al. (2021) underline, the gradual adoption of 4.0 technologies promotes intelligent HR ecosystems in which virtual HR assistants, automated processes and decision systems based on algorithms enhance accuracy, curb bias, and accelerate HR-related activities. In the tourism sector, Seočanac (2022) also adds that digital transformation in HR enables service-oriented industries to cope with large, diverse and dispersed workforces and enhance operational efficiency (real-time data systems, digital scheduling and AI-based competency mapping). All of these findings suggest that Smart HR 4.0 is not the upgrade of the IT tool but a strategic redefinition of HR processes as agile, scalable and evidence-based management.

More studies indicate that Smart HRM 4.0 has a profound impact on the organisational performance as it affects dynamic capabilities, innovation, and employee effectiveness. As demonstrated by Pillai and Srivastava (2023), Smart HR practices enhance sensing, seizing and reconfiguring capabilities, which enable companies to be constantly innovative and competitive in volatile environments. Shamaileh et al. (2023) have discovered that Smart HR 4.0 tools have a positive influence on job effectiveness of employees in terms of job satisfaction due to personalised learning, automated support applications and open assessment systems. The researchers emphasize the fact that digital HR interventions should be used to enhance the productivity and the morale of employees and state that technologically enhanced HR processes can result in the creation of a more engaged human resource. According to Gouda and Tiwari (2022), Smart HR 4.0 integration has a significant impact on the ambidexterity of innovation, thus allowing organisations to strike a balance between the exploratory and exploitative innovation using talent development and knowledge management systems that rely on data. Their fuzzy-TISM analysis and MICMAC analysis shows that the strategic innovation capabilities enabled by Smart HR 4.0 are enablers. All these works together indicate that Smart HR 4.0 makes organisations more efficient through building agile and innovative organisational cultures, reinforcing the accuracy of decisions, and creating adaptive HR architectures. By so doing, the literature is aligning itself to reflect that Smart HR 4.0 technologies are offering a robust outline of facilitating organisational performance, resilience and long-term competitiveness in the digital age of transformation.

Spiritual practices and their effect on the wellbeing of employees and harmony at the workplace

The influence of spiritual practices on SORT of employee welfare and organisational harmony has been discussed widely in the current organisation literature and there is an overall agreement regarding the effects of spirituality in enhancing psychological health, emotional stability, and communication between people.

Spiritual values and reflective practices have also been established to reduce stress among the employees by offering inner stability and mental fatigue especially in stressful workplace environments (Arnetz et al., 2013). One of the key points that they have raised in their work is the significance of the workplaces to be spiritually grounded in the growing conditions of trust, meaning and emotional support, which can be rather useful in terms of mental health improvement. Similarly, Gupta et al. (2020) have determined that meditation and Pranic healing result in a feeling of mental clarity, the reduction of emotional exhaustion, and the deeper inner connection between the staff members. They found that the workers who have spiritual practices have been identified to have higher level of optimism, less anxiety and better capacity to cope with their work at the workplace. Khatri and Gupta (2020) also justified this statement by arguing that spirituality at the workplace is a predictor of the overall wellbeing since it promotes the sensation of purpose, compassion and positive climate of organisational climate. All these studies indicate that spiritual practices are psychological buffers that increase the levels of employee morale and emotions and stress management at work, and hence significantly contribute to the wellbeing of the employees. In addition to improving the personal mental health, the spiritual practices also play a crucial role in creating unity and culture of working together at work place. Misra et al. (2021) noted that as spirituality is integrated into the organisational processes, workplace happiness is increased resulting in team integrity, trust among individuals and reduced conflict at the workplace. In a research of employees working in industrial sectors in Nigeria, Ajala (2013) found out that spiritual values enhance empathy, unity and mutual respect among the employees that ensure that organisational environments are harmonious. Chandra and Kumar (2022) in their systematic review indicated that spirituality enhances the sense of connectedness within the group of workers, which leads to supportive behaviours and reduces toxic communication. They asserted that high spirituality in work places will most probably lead to social coherence and shared responsibility. It was also proven by Agrawal and Khan that spirituality, in conjunction with emotional intelligence, has a significant positive impact on the wellbeing of the employees. Their research found out that the spiritually sensitive employees have healthier coping mechanisms, improved teamwork and job satisfaction. Combined with the literature, there is a strong indication that spiritual practices effectively improve the wellbeing of individuals as well as generate in harmony, cohesion and ethically sound workplaces and thus spirituality is an obligatory part of this millennial organisational development.

Integrated Frameworks Merging IKS, Smart HR 4.0 and Workplace Spirituality

The combination of Indian Knowledge System (IKS), Smart HR 4.0 and workplace spirituality has been a more and more examined area in the modern organisational studies as researchers are pursuing unified fields that incorporate technology, values and human consciousness. Banyhamdan et al. (2023) suggest a five-pathway integrated model that illustrates the involvement of spiritual values in the systematic inclusion in the organisational design, leadership and culture with a focus on inner transformation, ethical behaviour and collective purpose as the core of sustainable organisational operation. Their model is compatible with the IKS principles which also promote dharmic duty, self-awareness and holistic relationality in the ecosystems of organisations. Deshpande (2021) builds upon this combination by connecting the spirituality of the workplace with the organisational learning capacity and demonstrates that spiritual values enhance adaptability, innovation and mass customisation in the workplace that is technologically in a state of flux- the humanistic wisdom and digital demands synonymous in HR 4.0. The paper by Ohri and Dutta (2022) also indicates that HR practices founded on values in the presence of the spiritual culture substantially increases the engagement and performance of the organisation, which proves that innovative HR systems should be ethical and purpose-oriented. The same view is supported by Mir et al. (2020) who claim that spirituality has a direct impact on organisational performance by developing resilient, mindful and morally aligned workforce behaviours, and so integrated models working with cultural-spiritual knowledge and HR innovations are the key to achieving the best.

The convergence between artificial intelligence and workplace spirituality provides a new aspect of integrated frameworks. Bommisetti et al. (2023) emphasize that AI-based digital transformation will improve organisational flexibility but necessitate spiritual roots to reduce emotional exhaustion, depersonalisation and ethical threats, which proves the compatibility of Smart HR 4.0 technologies and inner wellbeing practices. This can be compared to the IKS that focuses on creating a balance between material advancement (artha) and ethical and spiritual awareness (dharma). Adnan et al. (2021) discover that spirituality plays the mediating role between moral leadership and employee engagement in the workplace, suggesting that the technology-advanced organisational systems can only work best when they are supported by spiritual meaning-making and moral leadership. The spirituality and knowledge management are further intertwined by Lakshmi and Das (2020) who claim that spiritual values can contribute to trust, sharing of knowledge and learning collectively, which are the main aspects of digital HR ecosystems with the strong focus on data-driven and collaborative operation. Taken together, these papers demonstrate that combined paradigms combining IKS, Smart HR 4.0 and spirituality are not just the figment of imagination but the requirement of organisations. They offer an example that technological innovation can go in line with ethical thinking, human wellbeing, holistic decision-making and value-performance oriented, allowing organisations to become resilient, conscious and futuristic systems in the digital age.

Impact of Combined IKS and HR 4.0 Approaches on Organisational Culture and Long-Term Resilience

Indian Knowledge System (IKS) remains applicable to HR 4.0 and the aspects of organisational culture and the ability to evolve into a long-term resilient entity are outlined by a highly persuasive framework, which is reinforced by the global literature on culture, technology adoption and resilience indirectly. Jackson (2011) notes that the organisational culture plays an important role in determining the rate of adoption of information systems, he points out that technology should be aligned to the values, beliefs and shared assumptions to bring about sustainable change. This is in line with the IKS school of thought that organisational behaviour is guided by cultural underpinnings like dharma (ethical duty), collective harmony and guna-based competence. On the same note, Pereira (2020) believes that the digital culture in Industry 4.0 settings must have adaptive mindset, openness to change and value-driven leadership, which IKS inherently develops based on self-understanding, discipline and holistic decision-making. When integrated into an IKS-based cultural paradigm, HR 4.0 technologies, including predictive analytics, AI-based recruitment and digital learning systems, can cause increased employee trust, open communication, and effective interaction. Moreover, Aduwo et al. (2023a) indicate that human resource leadership largely influences the organisational culture, collaboration and innovation, which implies that the practices based on cultures help organisations to take advantage of technology better. Simultaneously, the subsequent study of the authors (Aduwo et al., 2023b) notes that HR-technology-based platform can positively influence employee engagement and retention only under the condition of the culture where the emphasis is made on purpose, emotional security and recognition, which are dimensions that are closely related to IKS and its spiritual values. All these studies serve to support the thesis that long-term cultural evolution cannot be achieved with the help of digital devices; it requires a system of philosophy which will provide guidelines in the way technology is employed.

This view is reinforced by the literature on resilience that demonstrates that cultural intelligence and strategic practices of human resource management can help organisations to survive in a state of uncertainty, disruption and crisis. In their case study of Bangladeshi exporters, Ahamed et al. (2023) find that Eastern value systems, i.e., collectivism, mindfulness and adaptive strength, can create resilience when interacting with Western strategic orientation, as IKS can complement HR 4.0 to create strong organisational capacities. On the same note, Börekci et al. (2020) show that organisational culture can play a large role in resilience and risk behaviour in the long-term, providing evidence that a flexible system of flexibility, learning orientation and shared values enhances long-term performance. This is in line with the IKS frameworks like the yoga-based emotional regulation and karma-based responsibility which help the staff to maintain a stable position when

organisations change. Bouaziz and Hachicha (2021) also claim that HRM strategic practices contribute to the organisational resilience through enhancing the agility, proactive learning and competence development, which are further improved when IKS principles of whole-growth and ethical accountability guide the HR 4.0 analytics and digital resources. Hence, IKS and HR 4.0 synthesis generates an organisational environment that is culturally enriched and technologically empowered to react to external shocks effectively, cope with internal changes and maintain performance throughout the performance. Collectively, these research findings prove that adoption of ancient knowledge systems and modern HR technologies does not only enhance organisational culture; it also forms the basis of sustaining organisational resilience.

RESEARCH GAP

The available literature is rich in understanding organisational culture, digital transformation, HR leadership and resilience, but there is a clear research gap in the strategies of integrating traditional philosophical systems in a strategic manner with the latest HR technologies to create future-ready organisations. The literature on digital culture, adoption and utilization of information systems and technology-based HR systems has been extensively written and researched, but has not addressed the question of how the ancient cultural structures including the Indian Knowledge System can inform ethical, value-based and human-focused digital change. In the same way, as research on resilience emphasizes the significance of cultural intelligence and adaptive capability, the role of spiritually informed practices and indigenous knowledge in enhancing emotional stability, collective motivation and decision-making in technologically modern workplaces is ignored. Besides, current scholarship considers the HR 4.0 and cultural or spiritual frameworks as two distinct areas instead of exploring the overall impact of these two factors on the long-term organisational resilience. Empirical or conceptual literature regarding the incorporation of IKS principles in using digital HR solutions to establish a balanced organisational culture to facilitate innovation, wellbeing and sustained performance is limited. Therefore, the main gap in the research is exploring a cohesive construct that combines the IKS-related values, Smart HR 4.0 potential and spiritual rituals to deliver comprehensive organisational excellence in the ever-more digital and unpredictable climate.

METHODOLOGY

The present study relies on the research design of qualitative and exploratory studies that use mostly the extensive analysis of secondary data. In order to obtain a thorough insight into the integration of Indian Knowledge System (IKS), Smart HR 4.0 technologies, and spiritual practices into improving the organisational culture and resilience in the long-term, a methodical review of some 30-40 academic journal articles, books, policy papers, and case studies published over the last fifteen years was carried out. The major academic databases such as Scopus, Web of science, Google Scholar and institutional repositories were used to identify relevant literature. The screening criteria were based on the studies, which dealt with Indian philosophical management systems, digitalisation of HR, talent management with AI, organisational spirituality, organisational culture, and resilience-building in the modern organisational environment. The sources were filtered according to the methodological rigour, appropriateness to the organisational context, and role in understanding the interplay between the traditional knowledge systems, the modern HR technologies, and spiritual practices. The review was intended to set out common themes, facilitating factors, obstacles and strategic frameworks of applying a combined IKS-HR 4.0 strategy. Thematic analysis framework has been used to generalize the results and categorize the insights into the key dimensions which are ethical and value-based leadership, technology-driven engagement of employees, cultural alignment, strengthening resilience, and employee wellbeing in general.

The given methodological approach aided developing a conceptual framework, according to which Smart HR 4.0 tools can be successfully integrated with the principles of the Indian Knowledge System and spiritual

practices to improve the organisational culture, employee engagement, and long-term resilience. The combination of technological effectiveness and philosophical and spiritual foundation makes the study give a coherent prism through which one can examine the opportunities of hybrid management strategies in the contemporary organisational setting.

CONCEPTUAL FRAMEWORK

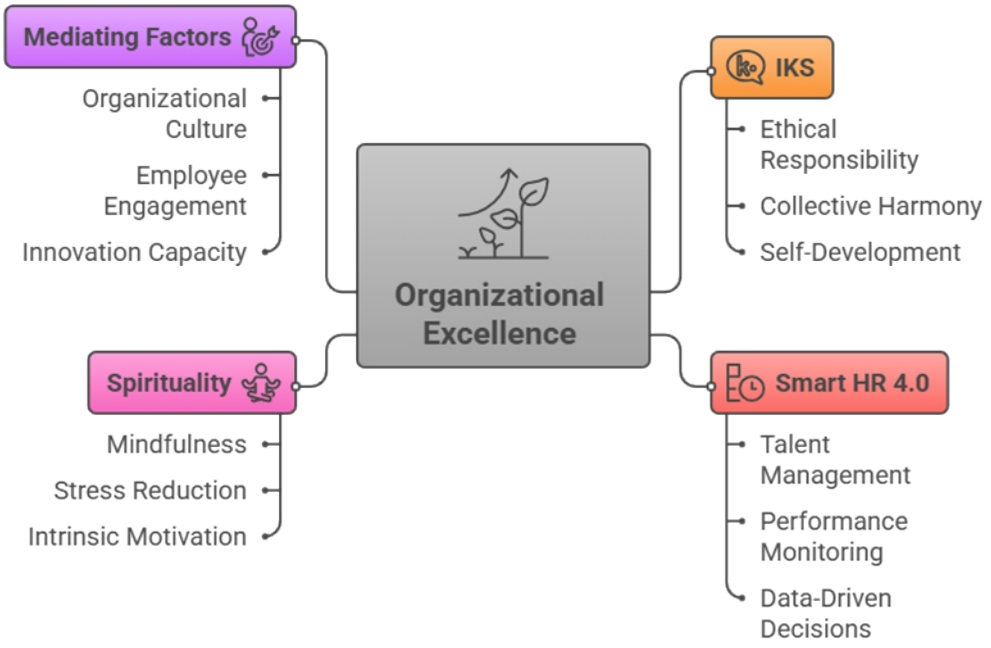

Fig.01 Sustainable Organizational Excellence Framework

The framework indicates that IKS principles include the philosophical and ethical base which will inform the organisational decision-making, the leadership behaviour, and interaction between employees. The principles affect the culture of organisations because they instil ethical responsibility, collective harmony and self-development values. Smart HR 4.0 will serve as a facilitator and will allow efficient talent management, performance monitoring, skill development, and data-driven decision-making. They are most effective in a cultural context that is IKS-coherent so that digital tools can advance human-friendly and ethical practice as opposed to a transactional process only. Spiritual practices are complementary processes, which enhance the wellbeing of employees, their mindfulness, minimisation of stress, and intrinsic motivation, which in turn enhances the cultural and work structure of the organisation. These three factors combined also affect the organisational culture, the involvement of employees and the ability to be innovative and eventually result in organisational excellence and sustainability.

The theory offers a comprehensive and integrated method of the modern management of organisations. The study hypothesizes that no amount of technological effectiveness completely can achieve sustainable growth without being supported by ethical direction, compatibility of all cultures and spiritual wellbeing. IKS will provide the moral compass and cultural depth, Smart HR 4.0 will be able to offer technological precision and business effectiveness, and spiritual practice will offer both mental comfort and inner motivation. The three elements are effectively transformed into practical outcomes with the help of mediating variables that are organisational culture, employee engagement, and innovation capacity. The combination of the frameworks provides a vision of a hybrid model where ancient wisdom exists as well as modern technology that is in a

synergistic relationship to each other, leading to productive, ethical, resilient, and human-centric work environments. This theoretical framework guides the research to explore options of integrating IKS, Smart HR 4.0, and spirituality in the development of sustainable organisational excellence in contemporary business environments.

RESULTS AND DISCUSSION

The conceptual framework discussion reveals that integration of the Indian Knowledge System (IKS) principles in the organisational practices can make a long way in achieving ethical, human, value based working climate. IKS provides the philosophical and moral foundation that informs the behaviour of the leaders, the decision making process and how they treat the employees. Companies that integrate the concept of IKS exhibit higher rates of shared harmony, moral responsibility and self-growth that influence the level of engagement and motivation rates of the workers in a favourable manner. The Smart HR 4.0 technologies also contribute to this framework to the extent that it becomes possible to make decisions based on the data, manage the talent, and continue to develop the skills. The results also show that the technical skills of the HR 4.0 within the framework of the IKS-fit cultural environment not only streamline the effectiveness of the working process but also reinforce the morals and humanistic approaches. The employees who are employed in the said conditions are better motivated intrinsically, collaborate and follow organisational values. It is also possible to mention that the incorporation of spiritual practices may provide measurable positive outcomes on the wellbeing and mindfulness of employees and stress management which, in its turn, will result in improved leadership performance and corporate harmony. It can be stated that these three dimensions, i.e., ethical wisdom (IKS), technological facilitation (Smart HR 4.0) and spiritual wellbeing are interconnected relationship that has a beneficial impact on organisational culture, improves the potential to innovate, and workers involvement. This is a step forward supporting the hypothesis that technology will not be an organisational excellence factor without ethical, cultural, and psychological conceptions.

The findings of the research also indicate that there exist numerous opportunities of integration of IKS, Smart HR 4.0 and spirituality to facilitate long term organisational sustainability. To begin with, IKS is the ethics guide and cultural beacon since he realizes that technological interventions are user-centric besides being transactional. Second, Smart HR 4.0 is capable of providing precision in performance control, decision support and skill development and old wisdom is transformed into useful organisational operations. Thirdly, the spiritual practices are the supplementary mechanisms, that build the psychological resilience, internal motivation, and the mindful leadership. When such synergistic interventions facilitated by organisational culture, employee engagement and innovation capacity, we will possess a hybrid of sustainable excellence, where ethical values, technological efficiency and employee wellbeing are self-supporting. This paper highlights that organisations with such an integrated approach exhibit greater flexibility, a higher level of employee satisfaction and increased resilience in the long-term. Furthermore, this integrated model deals with the modern organisational issues and challenges in the framework of considering old knowledge as a part of a new digital technology so that a working environment became more focused on performance and human values. The discussion proves that the overlap of IKS, Smart HR 4.0, and spiritual activities provides a holistic approach to ethical, efficient, and sustainable organisational development with specific emphasis on the importance of culturally consistent and spiritually enhanced technological deployment in the field of modern management.

SUGGESTIONS FOR FUTURE RESEARCH

There are some areas of potential enhancement and increased exploration of the role of integrating Indian Knowledge System (IKS), Smart HR 4.0, and spiritual practices in organisational settings. To begin with, the conceptual framework can be proven and improved by the empirical research on large scale primary data in

various industries, to offer the quantitative evidence of the effects of the concept on the employee engagement, innovation, and organisational performance. Cross-cultural and cross-regional studies can be used to study the impact of differences in acceptance of IKS principles or uptake of technology on the outcomes with an insight to provide into context-specific adaptations. Furthermore, longitudinal research may examine how the ethical wisdom, digital HR practices, and spiritual interventions combined with each other lead to organisational resilience, employee retention, and leadership development over time. Future studies can also consider sector-specific applications especially in high-technology, service, and rural firms to determine distinct integration directions and problems. The other topic of interest is the use of new technologies, including artificial intelligence, machine learning, and predictive analytics, to improve the Smart HR 4.0 practices without sacrificing the human-centric and ethical values based on IKS. Lastly, interdisciplinary research between psychology, management, information systems, and cultural studies might give more insight into how spirituality, ethics and technology may relate with each other to be able to enhance sustainability in organisational excellence and hence give a practical contribution to theory and practice.

CONCLUSION

The current research finds that the strategic and synergistic convergence of the principles of Indian Knowledge System (IKS), Smart HR 4.0 technologies, and workplace spirituality is likely to result in sustainable organisational excellence in the digital era. Although the Smart HR 4.0 has been shown to improve productivity by automation, predictive analytics and AI-based decision-making, these technological improvements cannot be used to create resilient and humane organisations. According to the findings, IKS can offer an ethical basis, cultural orientation, and value-based leadership to make sure that technology is people-focused and ethically sound. The ethical behaviour, intrinsic motivation, and trust, which are needed to manage the intricacies of digital transformation, are enhanced by such concepts as dharma, guna-based competencies, emotional regulation, and collective wellbeing. Meanwhile, psycho-emotional stabilisers such as mindfulness, meditation, gratitude and reflective self-awareness are spiritual interventions that could be utilised to alleviate stress, enhance clarity and compassionate leadership in increasingly difficult workplaces.

The integrated model developed in the course of this study demonstrates that the interplay of these three factors enhances positive organisational culture, boosts the level of employee engagement and fosters resiliency in the long-term view. IKS increases ethical awareness, Smart HR 4.0 is fueled by the precision of information and spirituality is what fosters emotional and psychological well-being. The next level is the synergistic effect they have created and the form of organisations that are technologically, ethically, psychologically favourable and culturally sustainable. The present study, therefore, reminds us of the fact that the future-ready organisations must be more innovative but more careful, effective and empathetic, and full of development and holistic wellbeing. The study offers an effective conceptual framework through which leaders, HR practitioners and policymakers can elicit value-based, robust and humane workspaces which will sustain the realities of the contemporary digitalized environment.

LIMITATIONS OF THE STUDY

1. The research is theoretical and is mainly based on the secondary sources, which prevents the empirical confirmation of the proposed framework.
2. The inconsistency in quality and methodological rigor of the literature reviewed might affect the insights.
3. It is limited to published research that may fail to cover contain any unpublished or regional research that could be relevant.
4. The rapid obsolescence of some of the conclusions is linked to the rapid growth of the digital technologies and organisational practices.

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Cross-Cultural Adaptation and Validation of a Consumer-Centric value Co-Creation Scale for E-waste Management: An Extended Theory of Planned Behavior Approach

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ABSTRACT

Background

Electrical and Electronic Waste (e-waste) has emerged as a significant environmental challenge in India, with consumer behavior playing a critical role in determining how electrical and electronic products are used, stored and ultimately discarded.

Objective: The study focuses on the translation and validation of a Hindi version of an extended Theory of Planned Behavior (TPB) based scale. It is seeks to examine the consumer engagements in e-waste management by adopting a consumer-centric approach that integrates value co-creation.

Method

The original scale was translated into Hindi following a structured cross-cultural adaptation procedure. To ensure conceptual clarity and contextual relevance for the target population, cognitive interviews were conducted, followed by expert-based content validation and pre-testing of the instrument. Data collected from 450 respondents were analyzed using Structural Equation Modeling (SEM) to assess the reliability and validity of the scale.

Findings

The Hindi version of the scale demonstrated strong internal consistency and satisfactory model fit. Core constructs, including attitude, subjective norms, perceived behavioral control, intention, responsible consumer behavior, and co-creation, retained their theoretical coherence in the adapted version. Minor refinements were introduced to enhance gender neutrality, simplify item wording, and incorporate commonly used English terms in cases where suitable Hindi equivalents were not available. Overall, the scale was effective in capturing responsible e-waste management behavior and revealed noticeable gaps in knowledge across different demographic groups.

Conclusion The validated Hindi scale offers a reliable, culturally relevant way to assess consumer behavior on e-waste. It can guide targeted awareness and policy efforts, supporting broader goals of sustainable consumption and urban responsibility in line with SDGs 11 and 12.

Keywords: *Consumer behavior, E-waste management, translation and adaptation, co-creation, TPB, India.*

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INTRODUCTION

E-waste generation has become a serious environmental and societal concern, as it is rapidly increasing five times faster than earlier expected. While earlier, waste was seen as material to be discarded, it is now more often seen as a useful resource within the principles of the circular economy. In many production cycles, waste can be repurposed, recovered and brought back into the system i.e. reintegrated through multiple methods. By doing this, resources are saved and waste is managed properly as well as effectively. This change may bring benefit to society as a whole (UNEP, 2021; Ellen MacArthur Foundation, 2019).

In recent years, Waste Electrical and Electronic Equipment (WEEE), commonly referred to as e-waste, has been drawing more attention. This is mainly because of it negative effects on everyday life and society as a whole. E-waste contains a mix of hazardous and valuable materials. As if, everyday electrical and electronic items/appliances such as computers, mobile phones,/smart phones, televisions, large appliances etc often contain toxic materials, including lead, mercury and flame retardants (UNEP, 2015; CPCB, 2020; CPCB, 2023). And the consumption and market demand for these appliances are quite high, which is the reason that has led to a rapid rise in their volume. As a result, e-waste is now considered a serious risk to both the environment and human health (Kumar, Holuszko & Espinosa, 2017; Sethurajan et al., 2019).

As per the data from the Global E-waste Monitor indicate that global e-waste generation exceeded 62 million tonnes in 2022. However, the figures do not remain the same, it is been rising continuously by 2.6 million tonnes annually (Global E-waste Monitor Report-2024). Despite this, only about 22% of e-waste was formally collected and recycled through authorized channels. The remaining waste makes the situation worse as it is improperly handled by untrained people or dumped into landfills without following any proper procedure or method (Statista, 2023). On the other hand, in India, the challenge is steadily increasing, with annual e-waste generation exceeding 2 million tonnes. A significant portion of this waste is managed by informal sectors which includes untrained workers (male, female or sometimes even minors). This raises serious concerns for individual health, public health as well as and environmental safety (Dutta, 2021; MoEFCC, 2022).

To overcome or manage these pressing issues, various regulatory measures such as the E-Waste Management Rules (2011; revised in 2016, 2018 and 2023) and the Extended Producer Responsibility (EPR) framework have been introduced. Despites these, their implementation remains limited or still become a challenge.

However, several academic studies have identified multiple barriers to effective e-waste management. Among the most critical are the dominance of informal recycling channels, limited formal infrastructure, and low levels of public engagement (Kiddee, 2013; Rajaram & Pekeur, 2014). In particular, low public engagement stands out as an area with significant potential for intervention and improvement. This concern is also mentioned in Sustainable Development Goal (SDG) 12, which emphasizes the need to shift away from wasteful patterns of production and consumption. The goal highlights behavioral change at the consumer level, where individual participation is crucial for managing e-waste through practices such as reduced consumption, reuse of products, proper recycling and engagement with formal recycling systems (UNEP, 2021). Despite this, the role of consumers as active contributors to solutions remains insufficiently explored in the existing literature.

Most published studies have primarily focused on consumer purchasing behavior or on the challenges associated with e-waste disposal. Comparatively fewer studies have examined how consumers themselves can take an active role in addressing the e-waste problem through responsible decision-making and participation. Although previous research has addressed consumer attitudes, awareness, intentions as well as habits. Further, there remains a need to better understand how these factors translate into responsible consumer behavior in the context of e-waste management (Kumar, 2019; Aboelmaged, 2021). In this regard, involving consumers as key stakeholders is increasingly recognized as a vital step in addressing the growing e-waste

challenge. Yet, despite rising interest in consumer awareness, limited attention has been paid to their actual behavioral engagement, particularly in developing country contexts.

Against this backdrop, a promising yet understudied concept is co-creation, defined as a collaborative process in which consumers actively engage with stakeholders such as service providers, producers and policymakers to develop shared solutions. Simply put, co-creation refers to active participation in the process rather than a passive role as end users of final outcomes (Prahalad, C. K., & Ramaswamy, V, 2004). Co-creation has been widely discussed as a mechanism for promoting sustainable consumption; however, its application within e-waste management remains limited (Vargo & Lusch, 2008; Shamim & Ghazali, 2017). This gap warrants further exploration, as co-creation offers opportunities to involve consumers more directly through initiatives such as participatory product design, recycling campaigns and take-back programs. At the same time, reverse logistics has gained increasing attention for its role in managing e-waste through processes such as reuse, resale, refurbishment and recycling. Nevertheless, many reverse logistics frameworks fail to adequately incorporate behavioral dimensions of consumers. As a result, without meaningful public involvement, e-waste continues to be poorly managed, thereby contributing to persistent environmental challenges (Mohd Sharif, 2017).

Several behavioral theories have been applied to understand recycling behavior such as Valence Theory, Technology Acceptance Model, Norm Activation Theory and Theory of Interpersonal Behavior. Among the various behavioral models discussed above, the Theory of Planned Behavior (TPB) is one of the most widely used and accepted frameworks. It helps explain how attitudes, subjective norms, perceived control, and intentions influence a person's behavior (Ajzen, 1991). However, the model has some limitations particularly in explaining how consumers weigh the pros and cons of recycling-related decisions (Awasthi, 2018; Nguyen, 2019; Patrao, 2023).

To address the limitations and gaps identified in the literature, the study was conducted in two phases. In the first phase, a consumer-centric value co-creation scale for e-waste management was developed and validated. The scale was grounded in an extended Theory of Planned Behavior (TPB) framework with Responsible Consumer Behavior (RCB) and Co-creation (CoC) incorporated as additional constructs. This extended framework offered a comprehensive understanding of how consumers engage with e-waste management practices. The findings further indicated that co-creation plays a moderating role in strengthening the relationship between intention and responsible consumer behavior.

During the initial phase of data collection, several participants particularly those from non-English speaking or linguistically diverse backgrounds, reported difficulties in fully understanding the English version of the scale. This highlighted the need for research instruments that are both culturally and linguistically appropriate, in order to ensure clarity, inclusiveness as well as meaningful participation.

Accordingly, the focus of the present phase of the study is to translate and culturally adapt the scale into Hindi. This process aims to enhance the validity, reliability and practical applicability of the instrument for Hindi-speaking populations. By validating the adapted version, the study contributes to making e-waste research more inclusive and enables a more accurate representation of diverse consumer perspectives in the Indian context, with implications for both academic inquiry and policy development.

MATERIALS AND METHODS

The scale was originally developed in English, followed by validation and reliability assessment of all constructs (Dave K et al., 2025_under peer review). Since the study was conducted in a predominantly Hindi-speaking context, cross-cultural adaptation and validation were necessary to ensure accurate data collection. Accordingly, the English version of the scale was translated into Hindi to enhance comprehensibility and relevance for the study participants.

The translation process followed the step-by-step guidelines proposed by Beaton et al. (2000) for the cross-cultural adaptation of self-report measures, with an emphasis on maintaining both linguistic accuracy and cultural appropriateness. In addition, the scale was evaluated for content validity and reliability prior to its administration, in order to confirm its suitability for use in the target population.

Translation, Validation and Internal Consistency of the Hindi Scale

The study involved the translation and cultural adaptation of the English version of the "Holistic Consumer-Centric Value Co-Creation Scale", along with an assessment of the content validity and reliability of its Hindi version. The objective was to ensure that the adapted instrument was both conceptually appropriate and psychometrically sound for use among Hindi-speaking respondents.

The translation and cross-cultural adaptation process followed the guidelines proposed by Beaton et al. (2000) for the adaptation of self-report measures. The procedure was carried out in two stages: first, the translation of the scale from English to Hindi along with cultural adaptation; and second, the evaluation of content validity and internal consistency of the Hindi version of the scale.

Part 1: Translation and Cultural Adaptation:

The following five steps were performed in "Part 1"

1. Forward translation
2. Synthesis of 2 translations
3. Back translation
4. Creation of pre-final version
5. Test of pre-final version

Forward Translation: This step was carried out by 2 bilingual and independent translators, who translated the scale from English into Hindi. One of the translators (T1) was familiar to the subject, while the other (T2) was not.

Synthesis of translations (T1 & T2): In this step, both the translations were read thoroughly by the third person who was known to the subject and good command on the language. A discussion was held amongst the third person and the translators (T1 and T2) to compare the 2 versions and analyze any ambiguous expressions. The aim of this step was to reach a consensus and a single version of the translated questionnaire.

Back-translation: In this step new bilingual translators were invited to back translate the questionnaire into English. The purpose of this step to check if the translated version truly captured the meaning of the original questionnaire.

Creation of the Pre-Final Version (Expert Committee Review): The fourth step involved forming an expert committee comprising methodologists, subject matter experts, language professionals, and the translators responsible for both forward and back translations.

The authors of the original English version of the questionnaire were also involved in the review process to ensure conceptual consistency and preserve the integrity of the original constructs. An expert committee examined all versions of the questionnaire, discussed areas of discrepancy and refined both the translated and back-translated items.

Following these deliberations, a set of modifications was proposed, leading to the development of the pre-final version of the questionnaire. This process ensured adequate cultural and linguistic equivalence of the instrument for the target population.

Suggestions included removing technical words with simpler terms wherever appropriate and add English words in parentheses for clarity (e.g.,"नवीनीकृत" (refurbished)"), and rephrasing complex sentences to make them shorter and easier to understand.

It was also advised to use gender-neutral expressions by including both "रखता हूँ" and "रखती हूँ" where appropriate and to avoid repeating words within items.

Furthermore, it was recommended that the language used in the questionnaire be kept at a level understandable to someone with approximately a 7th-grade education, ensuring accessibility for all respondents.

Test of the pre-final version: In this last step of the translational and cultural adaptation, the questionnaire was administered to 30 individuals from Delhi region, who have passed the eligibility criteria (inclusion criteria).

Participants were asked about their understanding on the questionnaire (process known as 'Cognitive Debriefing') and any difficulties in completing the questionnaire.

There were five questions (table 1) on each "Item" of the questionnaire which were asked to reach the consensus and participants' understanding towards the concept of the questionnaire. This process also helps establishing the acceptability of the Hindi version of the 'Holistic Consumer-Centric and Value Co-Creation Scale'.

Table 1: Cognitive Interview Questions for Scale Validation

Hindi	English Translation
क्या सवाल सामान्यतः स्पष्ट, समझने में आसान और उत्तर देने में सरल हैं?	Are the questions generally clear, easy to understand, easy to answer?
क्या ये सवाल आपके लिए महत्वपूर्ण और सार्थक हैं?	Are the items meaningful and important to you?
क्या निर्देश स्पष्ट और समझने में आसान हैं?	Are the instructions clear and easy to understand?
क्या प्रारूप (फार्मेट) समझने में आसान है? (क्या इसे खुद से भरना आसान है?)	Is the format easy to follow? (Is it easy to complete on your own?)
क्या आपको इस सवाल को समझने में कोई कठिनाई हुई?	Did you have any difficulty understanding this item/question?
यह सवाल आपके लिए क्या अर्थ रखता है?	What does this item mean to you?
क्या आप इस आइटम को पुनः लिखना चाहेंगे? (यदि हां, तो आप इसे कैसे पुनः लिखेंगे?)	Would you like to reword this item? (If so, how would you reword it?)
क्या यह सवाल आपकी स्थिति से संबंधित है?	Is this item relevant to your situation?
क्या इस सवाल के उत्तर विकल्प इसके साथ मेल खाते हैं? (अगर नहीं, तो कृपया कठिनाई बताएं और सुझाव दें कि आप इन्हें कैसे शब्दबद्ध (सुधारेंगे) करेंगे?)	Are the response options consistent with this item? (If no, please explain the difficulty and suggest how you would reword them.)

Source: Authors' own compilation

Twelve out of thirty participants reported difficulties with certain items (Item numbers 19, 20, 43 & 44) while completing the Hindi version of the Holistic Consumer-Centric and Value Co-Creation Scale for E-Waste Management during pre-testing. In addition, participants needed help understanding some words before answering, such as नवीनीकृत (refurbished), हितधारक (stakeholders), उत्पाद विकास (product development), and आवासीय सोसायटी (residential society).

Item 43: मुझे पता है कि अपने ई-कचरे का प्रबंधन कैसे करना है।

Item 44: मेरा मानना है कि मैं अपने ई-कचरे का प्रबंधन करने में सक्षम हूं।

Item 20: ई-कचरा प्रबंधन संतोषजनक है।

Item 19: ई-कचरा प्रबंधन लाभदायक है।

However, all thirty participants were able to read the Hindi version of the scale with little to no assistance. Participants generally reported that they understood the language and the concepts of the items in the questionnaire, except for a few difficult words.

Therefore, the English meanings of these difficult words were added in parentheses in the Hindi version of the scale after discussion with translators (T1 and T2).

Part 2: Content Validity

The following three steps were taken to establish content validity for the current study:

1. *Establishment of the Panel of Experts:*

   A total of eleven experts were requested to participate in the validation process of Hindi scale. Seven of them accepted the formal invitation, consisting of 2 subject experts from marketing, 1 language expert, 1 environmentalist, 1 methodologist, and 2 consumers. The study material and evaluation sheets were provided to these experts for their suggestions and feedback. Rest of them refused to participate as the scale was in Hindi and due to their busy schedule.

2. *Qualitative Review of the Items in the Scale:*

   Experts were asked to review the scale and provide feedback on the appropriateness of the title, clarity, conciseness and completeness of the directions, as well as the relevance and completeness of the content areas. Additionally, they were asked to evaluate the appropriateness and clarity of the items and whether the response options for each item were adequate.

3. *Quantitative Review of the Items in the Scale:*

   In this section, all the scoring were based on the factors such as 'Relevance, Clarity and Essentiality. All experts were requested to score under the following criteria to avoid bias. Therefore, all the responses/suggestions were recorded in an excel spreadsheet and codes were also assigned to avoid discrepancies.

   - *Relevance'* were scored under: not relevant (0), somewhat relevant (1), quite Relevant (2), very Relevant (3).
   - *Clarity'* was recorded under: not clear (0), item needs some revision (1), very Clear (2).
   - *Essentiality'* was rated as: not essential (0), useful but not essential (1), essential (2)

   Furthermore, the content validity ratio (CVR) calculated through the following formula introduced by Lawshe 1975:

$$CVR = \frac{n_e - \frac{N}{2}}{\frac{N}{2}}$$

Furthermore, the CVR was calculated for the entire set of questions based on the "Essentiality" scores. Only ratings marked as "essential" were considered for the CVR calculation; the other two categories "not essential" and "useful but not essential" were excluded from the calculation. This method ensures that the items included in the scale are highly relevant and important by the expert panel.

As a result, the present study established the content validity of the "A Holistic Consumer-Centric and Value Co-Creation Scale for E-Waste Management _ Hindi version." Items with a Content Validity Ratio (CVR) of at least 0.43 were retained, while those below 0.43 were either removed or revised based on the feedback from the 7 experts on the panel.

As per the expert panel's feedback, items numbered 3, 6 and 7 required modifications. Specifically, the phrase "रखती/रखता हूँ।" was missing at the end of certain sentences. For example, Item 3 was revised as follows:

"मैं अपने ई–कचरे को नए इलेक्ट्रिकल और इलेक्ट्रॉनिक उत्पादों से बदलने का इरादा रखती/रखता हूँ।"

Previously, the sentence was presented as:

"मैं अपने ई–कचरे को नए इलेक्ट्रिकल और इलेक्ट्रॉनिक उत्पादों से बदलने का इरादा रखता हूँ।"

These changes ensure gender-neutral language and grammatical completeness, enhancing the clarity and inclusivity of the scale items. Since the English version of the scale had already undergone content validity assessment, no major corrections were required in the Hindi version beyond minor linguistic adjustments. The expert panel recommended replacing certain technical terms with simpler words or adding English terms in parentheses for better understanding. For example:

Q6: "मरम्मत (रिपेयर)" instead of only "मरम्मत"

Q7: "नवीनीकृत (रिफर्बिश्ड)"

Q27: "डिस्पोज (निपटान)"

After incorporating the suggested revisions, the Hindi version of the scale was resubmitted to the same panel of experts for final review and approval prior to its administration to the participants. After re-evaluating the Content Validity Ratio (CVR) scores, none of the items fell below the threshold value of 0.43. The overall CVR for the scale was 0.90, reflecting a high level of agreement among the experts regarding the relevance and clarity of the items (Tables 2 and 3) (Lawshe, 1975). In addition, the Content Validity Index (CVI) was calculated for the Hindi version of the scale based on expert assessments of item relevance. For this purpose, relevance ratings were recoded such that scores of 2 or 3 were treated as relevant (coded as 1), while scores of 0 or 1 were treated as not relevant (coded as 0). The same coding procedure was applied to the English version of the scale (Table 2).

The item-level CVI (I-CVI) values for the Hindi version were all 0.85 or higher, indicating satisfactory relevance across all items. The scale-level indices also indicated satisfactory content validity, with S-CVI/Ave = 0.91 and S-CVI/UA = 0.34, meeting established benchmarks for content validity.

These findings establish a strong foundation for proceeding to subsequent phases of scale validation and implementation, ensuring the tool is linguistically and conceptually appropriate for use among Hindi-speaking participants in future research on e-waste management behaviors.

Table 3: Content Validity Index (CVI) for Hindi Scale Items

S.No.	Questions	Essentiality						
		Not essential (0)	Useful, but not essential (1)	Essential (2)	N (total number of experts)	Ne (number of experts indicating "essential")	N/2	CVR
1.	मैं अपने ई–कचरे (वेस्ट) को रिसाइकिल करने का इरादा रखती/रखता हूँ।		1	6	7	6	3.5	**0.71**
2.	मैं अपने ई–कचरे (वेस्ट) को पास के रिसाइकिलिंग स्टेशन पर छोड़ने का इरादा रखती/रखता हूँ।		1	6	7	6	3.5	**0.71**
3.	मैं ई–कचरे (वेस्ट) को रिटेलर या निर्माता को वापस करने का इरादा रखती/रखता हूँ।		1	6	7	6	3.5	**0.71**
4.	यदि आवश्यक हुआ तो मैं ई–कचरा रीसाइक्लिंग या प्रबंधन शुल्क का भुगतान करने का इरादा रखती/रखता हूँ।			7	7	7	3.5	**1.00**
5.	मैं अपने ई–कचरे को नए इलेक्ट्रिकल और इलेक्ट्रॉनिक उत्पादों से बदलने का इरादा रखती/रखता हूँ ।			7	7	7	3.5	**1.00**
6.	मैं अपने इलेक्ट्रिकल और इलेक्ट्रॉनिक उत्पादों के लिए ई–कचरे की मरम्मत (रिपेयर) का इरादा रखती/रखता हूँ।			7	7	7	3.5	**1.00**
7.	मैं नवीनीकृत (रिफर्बिश्ड) इलेक्ट्रिकल एवं इलेक्ट्रॉनिक उत्पाद खरीदने का इरादा रखती/रखता हूं।			7	7	7	3.5	**1.00**
8.	मेरा परिवार और दोस्त मुझसे अपेक्षा करता है कि मैं अपने ई–कचरे (वेस्ट) का सुरक्षित प्रबंधन करूँ।	1	1	5	7	6	3.5	**0.71**
9.	मेरा कार्यस्थल मुझसे अपेक्षा करता है कि मैं अपने ई–कचरे का सुरक्षित प्रबंधन करूँ।	1	1	5	7	5	3.5	**0.43**
10.	मेरे अधिकांश मित्र और सदस्यों सोचते हैं कि ई–कचरे का प्रबंधन करना सही काम है।			7	7	7	3.5	**1.00**

11.	मेरे अधिकांश सहकर्मियों का मानना है कि ई–कचरे का प्रबंधन करना सही काम है।		1	6	7	6	3.5	0.71
12.	यदि मेरे परिवार और मित्र ई–कचरे का उचित प्रबंधन करेंगे, तो मैं भी ऐसा करूँगी/करूँगा!			7	7	7	3.5	1.00
13.	मेरी आवासीय सोसायटी मुझे ई–कचरा प्रबंधन प्रथाओं में भाग लेने के लिए प्रभावित करता है।			7	7	7	3.5	1.00
14.	ई–कचरा प्रबंधन जिम्मेदारी है।		1	6	7	6	3.5	0.71
15.	ई–कचरा प्रबंधन अच्छा है।		1	6	7	6	3.5	0.71
16.	ई–कचरा प्रबंधन लाभदायक है।		1	6	7	6	3.5	0.71
17.	ई–कचरा प्रबंधन आसान है।		1	6	7	6	3.5	0.71
18.	ई–कचरा प्रबंधन समझदारीपूर्ण है।			7	7	7	3.5	1.00
19.	ई–कचरा प्रबंधन लाभदायक है।			7	7	7	3.5	1.00
20.	ई–कचरा प्रबंधन संतोषजनक है।			7	7	7	3.5	1.00
21.	एक उपभोक्ता के रूप में, मैं ई–कचरा प्रबंधन प्रथाओं में सुधार के लिए इलेक्ट्रिकल और इलेक्ट्रॉनिक उत्पादों की डिजाइनिंग और निर्माण प्रक्रिया में भाग लेना चाहूंगा।			7	7	7	3.5	1.00
22.	एक उपभोक्ता के रूप में, मैं ई–कचरा प्रबंधन प्रथाओं के बारे में जानकारी फैलाने में मदद करना चाहूंगा।			7	7	7	3.5	1.00
23.	मैं ई–कचरा प्रबंधन से संबंधित समाधान उपलब्ध कराने में विभिन्न हितधारकों (स्टेकहोल्डर्स) को सहयोग देना चाहूंगा।			7	7	7	3.5	1.00
24.	यदि मेरे पास ई–कचरा प्रबंधन के लिए उत्पाद और सेवा डिजाइन में सुधार करने का कोई अभिनव विचार है, तो मैं इसे कंपनी के साथ साझा करूंगा।		1	6	7	6	3.5	0.71
25.	यदि मेरे पास ई–कचरे के निपटान और प्रबंधन को बेहतर बनाने के बारे में कोई उपयोगी विचार है, तो मैं उसे कंपनी या समाज के साथ साझा करूंगा।		1	6	7	6	3.5	0.71
26.	एक उपभोक्ता के रूप में, यदि मुझे अवसर मिले तो मैं ई–कचरा प्रबंधन को समर्थन देने के लिए उत्पाद विकास के विभिन्न चरणों में उत्साहपूर्वक विचार प्रस्तुत करूंगा।		1	6	7	6	3.5	0.71

27.	एक उपभोक्ता के रूप में, मैं उन कंपनियों और उत्पादों का समर्थन करूंगा जो ई–कचरा प्रबंधन करते हैं।		1	6	7	6	3.5	0.71
28.	एक उपभोक्ता के रूप में, मैं अपने परिवार, समाज और कार्यस्थल में ई–कचरा प्रथाओं को सफल बनाने के लिए प्रतिबद्ध हूं।			7	7	7	3.5	1.00
29.	मुझे ई–कचरा प्रबंधन के बारे में जानकारी प्राप्त करना बहुत पसंद है।			7	7	7	3.5	1.00
30.	एक उपभोक्ता के रूप में, मैं उस कंपनी की प्रशंसा करता हूं जो ई–कचरा प्रबंधन का अभ्यास करती है।							
31.	एक उपभोक्ता के रूप में, मुझे बेहतर ई–कचरा प्रबंधन के लिए ई–उत्पाद / सेवा डिजाइन और विकास को प्रभावित करने से संतुष्टि मिलती है।			7	7	7	3.5	1.00
32.	एक उपभोक्ता के रूप में, ई–कचरा प्रबंधन प्रथाओं में मेरी भागीदारी मुझे मूल्यवान उपलब्धि की भावना प्रदान करती है।			7	7	7	3.5	1.00
33.	एक उपभोक्ता के रूप में, जब ई–कचरा प्रबंधन से जुड़े हितधारक अपने उत्पादों और सेवाओं को बेहतर बनाने के लिए मुझसे सुझाव मांगते हैं, तो मैं सकारात्मक प्रतिक्रिया देना पसंद करती / करता हूँ।			7	7	7	3.5	1.00
34.	ई–कचरे का प्रबंधन करना मेरी आदत बन गई है।	1		6	7	6	3.5	0.71
35.	मुझे एक आदत के तौर पर ई–कचरा प्रबंधन प्रथाओं में भाग लेना चाहिए।			7	7	7	3.5	1.00
36.	जब मैं कोई इलेक्ट्रॉनिक या इलेक्ट्रिकल उपकरण बदलता हूं, तो मैं पुराने उपकरण के निपटान के बारे में जानकारी ढूंढता हूं।		1	6	7	6	3.5	0.71
37.	मैं बिजली और इलेक्ट्रॉनिक उत्पादों को सामान्य (आम) कूड़ेदान में फेंक देता हूँ।		1	6	7	6	3.5	0.71
38.	मेरे द्वारा नए इलेक्ट्रिकल और इलेक्ट्रॉनिक उत्पाद केवल तभी खरीदे जाते हैं जब पुराने उत्पाद काम करना बंद कर देते हैं ।			7	7	7	3.5	1.00

39.	मैं इलेक्ट्रिकल और इलेक्ट्रॉनिक उत्पादों का निपटान (डिस्पोज) करते समय में पर्यावरण का ध्यान रखती/रखता हूँ।			7	7	7	3.5	**1.00**
40.	सरकार द्वारा शुरू किए गए कानून और नियम मुझे अपने ई–कचरे (वेस्ट) को सुरक्षित रूप से प्रबंधित करने के लिए प्रोत्साहित करते हैं।			7	7	7	3.5	**1.00**
41.	जब मैं नए इलेक्ट्रिकल और इलेक्ट्रॉनिक उत्पाद खरीदता हूं तो मैं यह सुनिश्चित करता हूं कि पुराने उत्पादों का उचित तरीके से निपटान (डिस्पोज) किया जाए।			7	7	7	3.5	**1.00**
42.	इलेक्ट्रिकल और इलेक्ट्रॉनिक उत्पाद खरीदते समय उत्पाद का टिकाऊपन एक महत्वपूर्ण कारक है।			7	7	7	3.5	**1.00**
43.	मुझे पता है कि अपने ई–कचरे का प्रबंधन कैसे करना है।			7	7	7	3.5	**1.00**
44.	मेरा मानना है कि मैं अपने ई–कचरे का प्रबंधन करने में सक्षम हूं।			7	7	7	3.5	**1.00**
45.	यह मुख्यतः मुझ पर निर्भर करता है कि मैं अपने ई–कचरे का प्रबंधन कर सकता हूं या नहीं।		1	6	7	6	3.5	**0.71**
								0.90

Source: Authors' own compilation

Table 3: Content Validity Index (CVI) for Hindi Scale Items

Item No.	Items	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Expert 6	Expert 7		Expert in Agree-ment (out of 7)	I-CVI	UA
1	मैं अपने ई–कचरे (वेस्ट) को रिसाइकिल करने का इरादा रखती/रखता हूँ।	1	1	1	1	1	1	1		7	1	1
2	मैं अपने ई–कचरे (वेस्ट) को पास के रिसाइकिलिंग स्टेशन पर छोड़ने का इरादा रखतीध्रखता हूँ।	0	1	1	1	1	1	1		7	1	1
3	मैं ई–कचरे (वेस्ट) को रिटेलर या निर्माता को वापस करने का इरादा रखती/रखता हूँ।	0	1	1	1	1	1	1		7	1	1

4	यदि आवश्यक हुआ तो मैं ई–कचरा रीसाइक्लिंग या प्रबंधन शुल्क का भुगतान करने का इरादा रखती/रखता हूँ ।	1	0	1	1	1	1	1		7	1	1
5	मैं अपने ई–कचरे को नए इलेक्ट्रिकल और इलेक्ट्रॉनिक उत्पादों से बदलने का इरादा रखती/रखता हूँ ।	1	1	0	1	1	1	1		7	1	1
6	मैं अपने इलेक्ट्रिकल और इलेक्ट्रॉनिक उत्पादों के लिए ई–कचरे की मरम्मत (रिपेयर) का इरादा रखती/रखता हूं।	1	1	1	1	1	0	1		6	0.857143	0
7	मैं नवीनीकृत (रिफर्बिश्ड) इलेक्ट्रिकल एवं इलेक्ट्रॉनिक उत्पाद खरीदने का इरादा रखती/रखता हूं।	1	1	1	1	1	0	1		6	0.857143	0
8	मेरा परिवार और दोस्त मुझसे अपेक्षा करता है कि मैं अपने ई–कचरे (वेस्ट) का सुरक्षित प्रबंधन करूँ।	1	1	0	1	0	1	1		5	0.714286	0
9	मेरा कार्यस्थल मुझसे अपेक्षा करता है कि मैं अपने ई–कचरे का सुरक्षित प्रबंधन करूँ।	1	1	1	0	0	1	1		5	0.714286	0
10	मेरे अधिकांश मित्र और सदस्यों सोचते हैं कि ई–कचरे का प्रबंधन करना सही काम है।	1	0	1	1	1	1	1		6	0.857143	0
11	मेरे अधिकांश सहकर्मियों का मानना है कि ई–कचरे का प्रबंधन करना सही काम है।	1	0	1	0	1	1	1		5	0.714286	0
12	यदि मेरे परिवार और मित्र ई–कचरे का उचित प्रबंधन करेंगे, तो मैं भी ऐसा करूँगी/करूँगा!	1	1	1	0	1	0	1		6	0.857143	0
13	मेरी आवासीय सोसायटी मुझे ई–कचरा प्रबंधन प्रथाओं में भाग लेने के लिए प्रभावित करता है।	0	1	1	0	1	1	1		5	0.714286	0
14	ई–कचरा प्रबंधन जिम्मेदारी है।	1	1	1	1	1	1	1		7	1	1
15	ई–कचरा प्रबंधन अच्छा है।	1	1	1	1	1	1	1		7	1	1
16	ई–कचरा प्रबंधन लाभदायक है।	1	1	1	1	1	1	1		7	1	1
17	ई–कचरा प्रबंधन आसान है।	1	1	1	1	1	1	1		7	1	1
18	ई–कचरा प्रबंधन समझदारीपूर्ण है।	1	1	1	1	1	1	1		7	1	1
19	ई–कचरा प्रबंधन लाभदायक है।	1	1	1	1	1	1	1		7	1	1
20	ई–कचरा प्रबंधन संतोषजनक है।	1	1	1	1	1	1	1		7	1	1
21	एक उपभोक्ता के रूप में, मैं ई–कचरा प्रबंधन प्रथाओं में सुधार के लिए इलेक्ट्रिकल और इलेक्ट्रॉनिक उत्पादों की डिजाइनिंग और निर्माण प्रक्रिया में भाग लेना चाहूंगा।	1	1	1	1	1	1	1		7	1	1

22	एक उपभोक्ता के रूप में, मैं ई–कचरा प्रबंधन प्रथाओं के बारे में जानकारी फैलाने में मदद करना चाहूंगा।	1	1	1	1	1	1	1		7	1	1
23	मैं ई–कचरा प्रबंधन से संबंधित समाधान उपलब्ध कराने में विभिन्न हितधारकों (स्टेकहोल्डर्स) को सहयोग देना चाहूंगा।	1	1	0	0	1	1	1		5	0.714286	0
24	यदि मेरे पास ई–कचरा प्रबंधन के लिए उत्पाद और सेवा डिजाइन में सुधार करने का कोई अभिनव विचार है, तो मैं इसे कंपनी के साथ साझा करूंगा।	1	1	1	1	0	1	1		6	0.857143	0
25	यदि मेरे पास ई–कचरे के निपटान और प्रबंधन को बेहतर बनाने के बारे में कोई उपयोगी विचार है, तो मैं उसे कंपनी या समाज के साथ साझा करूंगा।	1	1	1	0	1	1	1		6	0.857143	0
26	एक उपभोक्ता के रूप में, यदि मुझे अवसर मिले तो मैं ई–कचरा प्रबंधन को समर्थन देने के लिए उत्पाद विकास के विभिन्न चरणों में उत्साहपूर्वक विचार प्रस्तुत करूंगा।	1	1	1	1	1	1	1		7	1	1
27	एक उपभोक्ता के रूप में, मैं उन कंपनियों और उत्पादों का समर्थन करूंगा जो ई–कचरा प्रबंधन करते हैं।	1	1	1	1	1	1	1		7	1	1
28	एक उपभोक्ता के रूप में, मैं अपने परिवार, समाज और कार्यस्थल में ई–कचरा प्रथाओं को सफल बनाने के लिए प्रतिबद्ध हूं।	1	1	1	1	1	1	1		7	1	1
29	मुझे ई–कचरा प्रबंधन के बारे में जानकारी प्राप्त करना बहुत पसंद है।	1	1	1	1	1	1	1		7	1	1
30	एक उपभोक्ता के रूप में, मैं उस कंपनी की प्रशंसा करता हूं जो ई–कचरा प्रबंधन का अभ्यास करती है।	1	1	1	1	1	1	1		7	1	1
31	एक उपभोक्ता के रूप में, मुझे बेहतर ई–कचरा प्रबंधन के लिए ई–उत्पादध्सेवा डिजाइन और विकास को प्रभावित करने से संतुष्टि मिलती है।	1	1	0	1	1	1	1		6	0.857143	0
32	एक उपभोक्ता के रूप में, ई–कचरा प्रबंधन प्रथाओं में मेरी भागीदारी मुझे मूल्यवान उपलब्धि की भावना प्रदान करती है।	1	1	1	1	1	1	1		7	1	1

33	एक उपभोक्ता के रूप में, जब ई–कचरा प्रबंधन से जुड़े हितधारक अपने उत्पादों और सेवाओं को बेहतर बनाने के लिए मुझसे सुझाव मांगते हैं, तो मैं सकारात्मक प्रतिक्रिया देना पसंद करती/करता हूँ।	1	1	0	1	1	0	1		5	0.714286	0
34	ई–कचरे का प्रबंधन करना मेरी आदत बन गई है।	1	1	1	0	1	1	0		5	0.714286	0
35	मुझे एक आदत के तौर पर ई–कचरा प्रबंधन प्रथाओं में भाग लेना चाहिए।	1	0	1	1	1	1	1		6	0.857143	0
36	जब मैं कोई इलेक्ट्रॉनिक या इलेक्ट्रिकल उपकरण बदलता हूं, तो मैं पुराने उपकरण के निपटान के बारे में जानकारी ढूंढता हूं।	1	1	1	1	1	1	1		7	1	1
37	मैं बिजली और इलेक्ट्रॉनिक उत्पादों को सामान्य (आम) कूड़ेदान में फेंक देता हूँ।	1	1	1	1	1	1	0		6	0.857143	0
38	मेरे द्वारा नए इलेक्ट्रिकल और इलेक्ट्रॉनिक उत्पाद केवल तभी खरीदे जाते हैं जब पुराने उत्पाद काम करना बंद कर देते हैं ।	1	1	0	1	1	0	1		5	0.714286	0
39	मैं इलेक्ट्रिकल और इलेक्ट्रॉनिक उत्पादों का निपटान (डिस्पोज) करते समय में पर्यावरण का ध्यान रखती/रखता हूँ।	1	1	1	0	1	1	1		6	0.857143	0
40	सरकार द्वारा शुरू किए गए कानून और नियम मुझे अपने ई–कचरे (वेस्ट) को सुरक्षित रूप से प्रबंधित करने के लिए प्रोत्साहित करते हैं।	1	1	1	1	1	1	0		6	0.857143	0
41	जब मैं नए इलेक्ट्रिकल और इलेक्ट्रॉनिक उत्पाद खरीदता हूं तो मैं यह सुनिश्चित करता हूं कि पुराने उत्पादों का उचित तरीके से निपटान (डिस्पोज) किया जाए।	0	1	1	1	1	1	1		6	0.857143	0
42	इलेक्ट्रिकल और इलेक्ट्रॉनिक उत्पाद खरीदते समय उत्पाद का टिकाऊपन एक महत्वपूर्ण कारक है।	1	1	1	1	1	1	1		7	1	1
43	मुझे पता है कि अपने ई–कचरे का प्रबंधन कैसे करना है।	1	1	1	1	1	1	0		7	1	1
44	मेरा मानना है कि मैं अपने ई–कचरे का प्रबंधन करने में सक्षम हूं।	1	0	1	1	1	1	1		7	1	1
45	यह मुख्यतः मुझ पर निर्भर करता है कि मैं अपने ई–कचरे का प्रबंधन कर सकता हूं या नहीं।	1	1	1	1	1	1	1		7	1	1

		41	40	39	37	42	40	41		**S-CVI/ Ave**	**0.9111**	**25**
	Proportion Relevance	0.554054	0.540541	0.527027	0.5	0.567568	0.540541	0.554054	0.541	**S-CVI/ UA (Universal Agree-ment)**		**0.34**

Source: Authors' own compilation

Part 3: Reliability

The reliability analysis was conducted to assess the internal consistency of the constructs measured in the Hindi version of the scale. In the present study, internal consistency was evaluated using data from 450 respondents, following the same methodological approach adopted in the original English version of the Holistic Consumer-Centric and Value Co-Creation Scale for E-Waste Management (Dave K et al., 2025, under peer review) and other scale development studies (Laeequddin et al., 2022). A respondent-to-item ratio of 10:1 was maintained. This help us to ensure how well the items of the scale are consistent to each other. However, for reliability testing, both males and females individuals were included. Only individuals aged 18 and above who could read and write in Hindi were included in the study.

Cronbach's Alpha values for the constructs ranged from 0.455 to 0.906, indicating acceptable to excellent reliability. The construct of Co-Creation (CoC) demonstrated the highest reliability with a Cronbach's Alpha of 0.906 across 13 items, reflecting excellent internal consistency.

Attitude (ATT) demonstrated strong internal consistency (α = 0.846) across seven items. Intention (INT) and Responsible Consumer Behaviour (RCB) also showed good reliability, with Cronbach's alpha values of 0.777 and 0.785, respectively. Subjective Norm exhibited acceptable reliability (α = 0.743) based on six items. In contrast, Perceived Behavioral Control (PBC) recorded a comparatively lower Cronbach's alpha value of 0.562 across three items, placing it at the lower boundary of acceptability. This reduced level of internal consistency may be attributed to the wording or interpretation of specific items within the construct.

For example, the statement "मेरा मानना है कि मैं अपने ई–कचरे का प्रबंधन करने में सक्षम हूं।" contains the term "प्रबंधन," which some participants reported as difficult to understand. Replacing this term with a simpler word such as "संभालने" could improve clarity; however, such modifications risk altering the original conceptual meaning. Moreover, during the back-translation process, this substitution created challenges in preserving conceptual equivalence with the original English version. Despite this issue, the overall reliability results indicate that most constructs in the scale are measured with satisfactory internal consistency, providing a reliable foundation for subsequent analyses.

STATISTICAL ANALYSIS

Descriptive statistics were used to summarize the demographic characteristics of the sample and to examine the distribution of the data. Measures such as means, standard deviations, frequencies, and percentages were computed for all relevant variables. Statistical analyses were performed using SPSS (version 26), while Microsoft Excel was used for data organization and preliminary management.

In addition to the above, Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM) were conducted using Smart_PLS (version 4). These analyses were carried out to assess the validity and reliability of the measurement model and to examine the relationships among the study constructs. The sample size was considered adequate to ensure sufficient statistical power, based on the commonly accepted respondent_to_item ratio of 10:1.

RESULTS

Descriptive Statistics:

The final sample consisted of 450 respondents, of whom 53.6% were male and 46.4% were female, indicating a relatively balanced gender distribution. Most respondents (47.6%) were aged between 18–30 years, followed by 31–40 years (32.0%), 41–50 years (13.3%), 51–60 years (5.6%), and above 60 years (1.6%). The mean age category of the respondents was 1.82 (SD = 0.97), indicating that the sample largely comprised young to middle-aged individuals.

With respect to educational qualification, most participants were graduates (59.8%) or held professional degrees (23.3%), while only a small proportion reported education below the high school level. In terms of occupation, the largest groups were professionals (31.8%) and unemployed respondents (33.6%), followed by those engaged in clerical work (11.3%) and sales or shop-related occupations (9.1%). Socioeconomic status analysis revealed that the majority of respondents belonged to the upper middle class (61.8%), followed by the lower middle class (20.4%) and the upper class (10.9%). Only a limited number of participants were classified under the upper lower (5.8%) or lower class (1.1%) categories. Marital status data showed that 48.9% of the respondents were married, while 49.1% reported being single, with only a small proportion being divorced or separated. Regarding family structure, 55.1% of participants lived in nuclear families, whereas 44.9% resided in joint family settings. Geographically, a slight majority of respondents were from the Delhi–NCR region (53.8%), while the remaining 46.2% were from Uttar Pradesh (Table 4).

Table 4. Socio-Demographic Profile of Respondents (N = 450)

Variable	Category	n (%)
Knowledge Level	Poor Knowledge	256 (56.9%)
	Good Knowledge	194 (43.1%)
Age Group	18–30 years	214 (47.6%)
	31–40 years	144 (32.0%)
	41–50 years	60 (13.3%)
	51–60 years	25 (5.6%)
	60 years and above	7 (1.6%)
Gender	Male	241 (53.6%)
	Female	209 (46.4%)
Education	Illiterate	1 (0.2%)
	Primary School	2 (0.4%)
	Middle School	2 (0.4%)
	High School	35 (7.8%)
	Intermediate/Diploma	36 (8.0%)
	Graduate	269 (59.8%)
	Professional Degree	105 (23.3%)
Occupation	Unemployed	151 (33.6%)
	Elementary Occupation	22 (4.9%)
	Craft and Trade Workers	11 (2.4%)

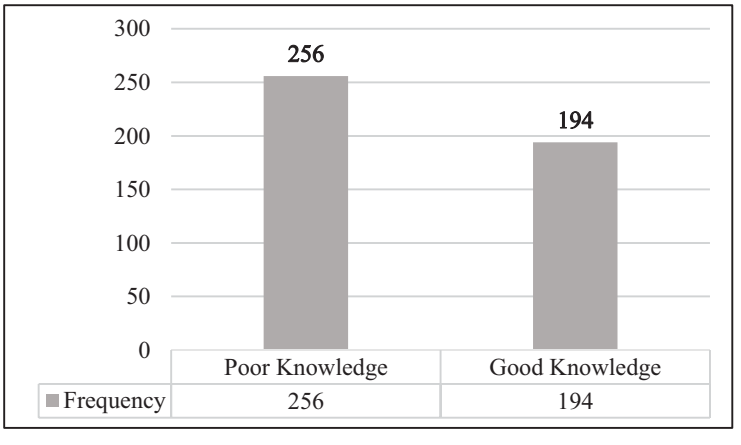
	Skilled Agricultural & Fishery Workers	2 (0.4%)
	Shop/Sales Workers	41 (9.1%)
	Clerk	51 (11.3%)
	Technicians/Associate Professionals	15 (3.3%)
	Professional	143 (31.8%)
	Legislators, Senior Officials, Managers	14 (3.1%)
Marital Status	Single	221 (49.1%)
	Married	220 (48.9%)
	Divorced	5 (1.1%)
	Separated	4 (0.9%)
Family Type	Nuclear	248 (55.1%)
	Joint	202 (44.9%)
Socioeconomic Status	Lower (V)	5 (1.1%)
	Upper Lower (IV)	26 (5.8%)
	Lower Middle (III)	92 (20.4%)
	Upper Middle (II)	278 (61.8%)
	Upper (I)	49 (10.9%)
State	Delhi–NCR	242 (53.8%)
	Uttar Pradesh	208 (46.2%)

Source: Authors' own compilation

Knowledge scores were calculated using participants' responses to seven Likert-scale items measuring awareness related to e-waste. Responses of "Agree" or "Strongly Agree" were coded as 1, representing adequate knowledge, while all other responses were coded as 0. The total knowledge score therefore ranged from 0 to 7. Based on these scores, participants were grouped into two categories: those scoring between 0 and 4 were classified as having poor knowledge, whereas those scoring between 5 and 7 were considered to have good knowledge.

Overall, 56.9% of the respondents were categorized under poor knowledge, while 43.1% demonstrated good levels of knowledge regarding e-waste (Figure 1).

Figure 1: Distribution of Respondents by Knowledge Level on E-Waste



PLS-SEM: The data were analyzed to examine the measurement properties of the study constructs and to test the proposed model. Partial Least Squares Structural Equation Modeling (PLS-SEM) was conducted using SmartPLS (version 4.0).

Factor Loadings and Item Retention: The initial measurement model consisted of 45 items across six constructs: Attitude (ATT), Subjective Norms (SN), Perceived Behavioral Control (PBC), Responsible Consumer Behavior (RCB), Co-creation (CoC), and Intention (INT). An examination of outer loadings indicated that five items (RCB4, RCB5, RCB9, CoC1 and INT1) had loading values below the recommended threshold of 0.60 and were therefore removed from further analysis (Hair et al., 2019). The remaining 40 items showed satisfactory factor loadings, with most values exceeding 0.70, suggesting adequate associations with their respective latent constructs. These results support the retention of the selected items for subsequent assessments of reliability and validity (see Table 5).

Table 5: Outer Loadings of Retained Measurement Items for Each Construct

ITEMS	OUTER LOADINGS
ATT1 <- ATT_Attitude	0.687
ATT2 <- ATT_Attitude	0.732
ATT3 <- ATT_Attitude	0.756
ATT4 <- ATT_Attitude	0.776
ATT5 <- ATT_Attitude	0.701
ATT6 <- ATT_Attitude	0.741
ATT7 <- ATT_Attitude	0.716
CoC1 <- CoC_Co-Creation	0.617
CoC2 <- CoC_Co-Creation	0.630
CoC3 <- CoC_Co-Creation	0.619
CoC4 <- CoC_Co-Creation	0.630
CoC5 <- CoC_Co-Creation	0.631
CoC6 <- CoC_Co-Creation	0.618
CoC7 <- CoC_Co-Creation	0.722
CoC8 <- CoC_Co-Creation	0.626
CoC9 <- CoC_Co-Creation	0.663
CoC10 <- CoC_Co-Creation	0.689
CoC11 <- CoC_Co-Creation	0.696
CoC12 <- CoC_Co-Creation	0.607
CoC_Co-Creation x INT_Intention -> CoC_Co-Creation x INT_Intention	1.000
INT1 <- INT_Intention	0.674
INT2 <- INT_Intention	0.709
INT3 <- INT_Intention	0.691
INT4 <- INT_Intention	0.614

INT5 <- INT_Intention	0.681
INT6 <- INT_Intention	0.687
PBC1 <- PBC_Perceived Behavioral Control	0.688
PBC2 <- PBC_Perceived Behavioral Control	0.794
PBC3 <- PBC_Perceived Behavioral Control	0.742
RCB1 <- RCB_Responsible Consumer Behaviour	0.767
RCB2 <- RCB_Responsible Consumer Behaviour	0.669
RCB3 <- RCB_Responsible Consumer Behaviour	0.771
RCB4 <- RCB_Responsible Consumer Behaviour	0.734
RCB5 <- RCB_Responsible Consumer Behaviour	0.769
RCB6 <- RCB_Responsible Consumer Behaviour	0.716
SN1 <- SN_Subjective Norm	0.814
SN2 <- SN_Subjective Norm	0.811
SN3 <- SN_Subjective Norm	0.782
SN4 <- SN_Subjective Norm	0.729
SN5 <- SN_Subjective Norm	0.672
SN6 <- SN_Subjective Norm	0.622

Source: Authors' own compilation

Convergent and Discriminant Validity: Convergent validity was examined using the Average Variance Extracted (AVE) values, as presented in Tables 6(A), 6(B), and 6(C). Most constructs recorded AVE values above the recommended threshold of 0.50. However, Co-creation (AVE=0.418) and Intention (AVE=0.458) showed slightly lower values. Despite this, Composite Reliability (CR) values for all constructs exceeded 0.70 and Cronbach's alpha values for the majority of constructs were also above 0.70, indicating acceptable levels of internal consistency and reliability.

Although the AVE values for Co-creation and Intention were marginally below the suggested cutoff, both constructs were retained due to their strong theoretical grounding and relevance within the context of responsible e-waste behavior. The 'Intention' construct represents key behavioral tendencies associated with responsible e-waste practices, including willingness to recycle, return products to retailers, pay for proper disposal, repair electronic devices and consider purchasing refurbished products. Similarly, 'Co-creation' reflects the extent to which consumers actively participate in improving e-waste management by sharing information, raising awareness and supporting environmentally responsible initiatives. These dimensions are central to understanding consumer engagement in sustainable e-waste practices. Therefore, despite the slightly lower AVE, the inclusion of these constructs was considered conceptually justified.

Discriminant validity was assessed using the Fornell-Larcker criterion and the Heterotrait-Monotrait (HTMT) ratio. The Fornell-Larcker results indicated adequate discriminant validity, as the square root of the AVE for each construct exceeded its correlations with other constructs. In addition, most HTMT values were below the recommended threshold of 0.85 (Henseler et al., 2015). The highest HTMT value was observed between 'Responsible Consumer Behavior' and 'Perceived Behavioral Control' (HTMT=0.882), slightly above the suggested limit. This result can be explained by the conceptual proximity of the two constructs, as individuals

who perceive greater control over their actions are more likely to engage in responsible e-waste behaviors. Overall, the findings provide sufficient evidence to support the discriminant validity of the measurement model and indicate that the constructs exhibit satisfactory psychometric properties.

Table 6 (A) Reliability and Convergent Validity of Constructs

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
ATT_Attitude	0.856	0.865	0.889	0.533
CoC_Co-Creation	0.874	0.881	0.896	0.418
INT_Intention	0.763	0.764	0.835	0.458
PBC_Perceived Behavioral Control	0.593	0.596	0.786	0.551
RCB_Responsible Consumer Behaviour	0.833	0.833	0.878	0.545
SN_Subjective Norm	0.836	0.851	0.879	0.551

Source: Authors' own compilation

Table 6 (B) Discriminant Validity – Heterotrait-Monotrait Ratio (HTMT)

ITEMS	Heterotrait-monotrait ratio (HTMT)
CoC_Co-Creation <-> ATT_Attitude	0.575
INT_Intention <-> ATT_Attitude	0.510
INT_Intention <-> CoC_Co-Creation	0.648
PBC_Perceived Behavioral Control <-> ATT_Attitude	0.532
PBC_Perceived Behavioral Control <-> CoC_Co-Creation	0.772
PBC_Perceived Behavioral Control <-> INT_Intention	0.601
RCB_Responsible Consumer Behaviour <-> ATT_Attitude	0.510
RCB_Responsible Consumer Behaviour <-> CoC_Co-Creation	0.731
RCB_Responsible Consumer Behaviour <-> INT_Intention	0.487
RCB_Responsible Consumer Behaviour <-> PBC_Perceived Behavioral Control	0.882
SN_Subjective Norm <-> ATT_Attitude	0.398
SN_Subjective Norm <-> CoC_Co-Creation	0.634
SN_Subjective Norm <-> INT_Intention	0.669
SN_Subjective Norm <-> PBC_Perceived Behavioral Control	0.494
SN_Subjective Norm <-> RCB_Responsible Consumer Behaviour	0.492

Source: Authors' own compilation

Table 6 (A) Reliability and Convergent Validity of Constructs

ITEMS	ATT_ Attitude	CoC_Co-Creation	INT_ Intention	PBC_ Perceived Behavioral Control	RCB_ Responsible Consumer Behaviour	SN_ Subjective Norm
ATT_Attitude	0.730					
CoC_Co-Creation	0.518	0.647				
INT_Intention	0.430	0.530	0.676			
PBC_Perceived Behavioral Control	0.400	0.575	0.411	0.743		
RCB_Responsible Consumer Behaviour	0.452	0.649	0.397	0.606	0.739	
SN_Subjective Norm	0.354	0.541	0.552	0.358	0.414	0.742

Source: Authors' own compilation

Collinearity Assessment and Model Fitness: As per the findings, collinearity among the indicators was examined using Variance Inflation Factor (VIF) values. All VIF scores were below the recommended threshold of 3.0, suggesting that multicollinearity was not a concern and that the parameter estimates of the model were not adversely affected. Here, the Model fit was assessed using the Standardized Root Mean Square Residual (SRMR), as reported in Table 7. The SRMR value for the saturated model was 0.075, while the estimated model yielded a value of 0.079. Both values fall within the acceptable range and remain below the suggested cut-off of 0.08 (Hu & Bentler, 1999), indicating a satisfactory fit between the proposed model and the observed data.

Table 7: Model fit summary

	Saturated model	Estimated model
SRMR	0.075	0.079
d_ULS	4.630	5.135
d_G	1.112	1.152
Chi-square	2801.483	2861.946
NFI	0.671	0.664

Source: Authors' own compilation

With respect to the explanatory strength of the model, the R^2 value for Intention was 0.392, while Responsible Consumer Behavior recorded an R^2 value of 0.424. These values indicate a moderate level of explanatory power, which is generally considered acceptable within social science research contexts (Hair et al., 2019). Effect size estimates (f^2) showed that Co-creation exerted a substantial influence on Responsible Consumer Behavior (f^2=0.463), whereas Subjective Norms demonstrated a medium effect on Intention (f^2=0.229).

In contrast, the effects of Attitude (f^2=0.059) and Perceived Behavioral Control (f^2=0.041) on Intention were relatively small, although still meaningful. The interaction between Co-creation and Intention in predicting Responsible Consumer Behavior yielded an f^2 value of 0.000, indicating a negligible interaction effect within the current model. Taken together, these results indicate that the structural model adequately captures the key relationships underlying consumer behavior in the context of e-waste management.

T-Statistics: Hypothesis testing

Table 8 presents the structural relationships among the study constructs, estimated using a bootstrapping procedure with 5,000 resamples. The significance of the hypothesized paths was evaluated based on the path coefficients and their associated t-values and p-values.

The results indicate that Attitude (β=0.213, t=4.716, $p < 0.001$), Subjective Norms (β=0.412, t = 9.438, $p < 0.001$), and Perceived Behavioral Control (β=0.178, t=3.981, $p < 0.001$) have shown statistically significant and positive influence on Intention. The results are consistent with the key assumptions of the Theory of Planned Behavior (TPB), indicating that individuals with more favorable attitudes, stronger social influences and higher perceived control are more likely to develop intentions toward responsible e-waste practices. In this context, Intention showed a marginally significant association with Responsible Consumer Behavior (β=0.074, t=1.700, p=0.089), suggesting that although intention remains a relevant predictor, its independent effect may be limited in the absence of additional facilitating factors. In contrast, Co-creation showed a strong and significant effect on Responsible Consumer Behavior (β=0.609, t=17.336, $p < 0.001$), highlighting the importance of collaborative engagement between consumers and service providers in encouraging sustainable e-waste management practices.

Table 8: Path coefficients and significance levels based on bootstrapping analysis

ITEMS	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
ATT_Attitude -> INT_Intention	0.213	0.214	0.045	4.716	0.000
CoC_Co-Creation ->	0.609	0.612	0.035	17.336	0.000
RCB_Responsible Consumer Behaviour					
CoC_Co-Creation x INT_ Intention -> RCB_Responsible Consumer Behaviour	0.001	0.001	0.024	0.028	0.978
INT_Intention -> RCB_ Responsible Consumer Behaviour	0.074	0.076	0.043	1.700	0.089
PBC_Perceived Behavioral Control -> INT_Intention	0.178	0.182	0.045	3.981	0.000
SN_Subjective Norm -> INT_Intention	0.412	0.414	0.044	9.438	0.000

Source: Authors' own compilation

DISCUSSION

The present study focused on translating and validating a consumer-oriented scale for e-waste management from English to Hindi, using an extended Theory of Planned Behavior (TPB) framework. Effective data collection depends largely on the use of language that respondents can easily understand and relate to. In a multilingual context such as India, the availability of research instruments in regional languages like Hindi is particularly important for ensuring wider participation across different socio-demographic groups. Using

culturally and linguistically adapted tools allows participants to better comprehend the survey items and respond more accurately, thereby improving the overall quality and reliability of the data, especially in settings where proficiency in English may be limited.

In this study, the 'Holistic Consumer-Centric and Value Co-Creation Scale for E-Waste Management' was translated and validated in Hindi to facilitate broader participation among respondents. The translation followed established and standardized procedures to maintain both conceptual integrity and contextual relevance. As noted by Kalgren et al. (2021), cross-cultural scale translation is not a simple word-for-word exercise; rather, it involves balancing fidelity to the original theoretical framework with the need for clarity and comprehensibility for the target population.

Based on cognitive interviews and validity assessments, several refinements were introduced. These included simplifying complex expressions, incorporating gender-neutral language and retaining certain commonly used English terms in cases where suitable Hindi equivalents were either unclear or overly technical. These adjustments were intended to improve participant comprehension while preserving the original meaning of the scale items.

Psychometric evaluation of the Hindi version was carried out using data from 450 participants. The findings indicated satisfactory internal consistency, reliability and structural validity of the scale. Cronbach's alpha and composite reliability values across all constructs were within acceptable ranges, reflecting a strong level of internal consistency. Furthermore, the Average Variance Extracted (AVE) values provided support for convergent validity, indicating that the scale items adequately captured their respective constructs. The structural equation model also showed satisfactory fit, with SRMR values below 0.08. In terms of predictive strength, the R^2 values suggested a moderate level of explanation for both Intention ($R^2 = 0.392$) and Responsible Consumer Behaviour (RCB) ($R^2=0.424$). Taken together, these results indicate that the measurement and structural properties of the scale remain stable in the Hindi version and that the underlying theoretical relationships are applicable within the Hindi-speaking context.

Among the path coefficients, Attitude ($\beta = 0.213$, $p < 0.001$), Subjective Norm ($\beta = 0.412$, $p < 0.001$), and Perceived Behavioral Control ($\beta = 0.178$, $p < 0.001$) significantly predicted Intention. In contrast, Intention showed a relatively weaker association with Responsible Consumer Behaviour ($\beta=0.074$, $p=0.089$), while Co-creation emerged as a strong predictor of Responsible Consumer Behaviour ($\beta=0.609$, $p<0.001$). This pattern indicates that although intention contributes to responsible e-waste behavior, participatory and collaborative engagement through co-creation plays a more influential role in encouraging such practices.

The patterns observed in this study are consistent with the literature published on e-waste awareness in the Indian context. For example, studies by Borthakur and Govind (2015, 2018) and Dwivedy and Mittal (2013) have reported that a large proportion of consumers lack adequate awareness of the risks associated with e-waste and appropriate disposal practices, which in turn influences their willingness to recycle. In the present study findings, participants often described e-waste management using terms such as “responsible,” “sensible,” and “beneficial,” yet noticeable gaps in knowledge were still evident. Respondents with higher levels of awareness were more likely to engage in responsible recycling behaviors, reflecting similar trends reported by Kumar et al. (2017). This suggests that targeted awareness initiatives remain essential for addressing regional and demographic disparities in e-waste understanding. Furthermore, including co-creation as a construct offers a more forward-looking perspective on consumer engagement by shifting attention from passive awareness to active involvement in environmental problem-solving. This perspective is grounded in the concept of value co-creation proposed by C. K. Prahalad and Venkat Ramaswamy (2004), and later extended by Stephen Frow et al. (2011), where consumers are viewed as contributors to value creation rather than mere end users. In this sense, sustainable consumption is shaped not only by individual awareness but also by collective participation in developing practices and innovations aimed at reducing waste.

Extending such frameworks across linguistic and cultural contexts further strengthens the case for using locally adapted research instruments, a position also supported by Kalgren et al. (2021), who emphasize the importance of contextual sensitivity in scale translation.

Finally, the validated Hindi version of the scale helps address an important gap by offering a reliable and context-sensitive instrument for research, public education, awareness initiatives, and policy-related work in the area of e-waste management. Beyond serving as a translated measure, the scale provides a practical means of identifying consumer groups or communities where limitations in awareness and responsible behavior are more prevalent. This allows researchers and practitioners to better locate segments that may require greater attention or support. The scale can also be used in future studies to design targeted interventions, particularly in settings where existing waste management practices remain weak or fragmented. Instead of adopting a generalized, one-size-fits-all approach, the availability of evidence-based insights enables more focused and context-specific actions. In this way, the scale has the potential to contribute to the development of practical and locally relevant solutions, especially in regions facing persistent challenges in e-waste management. Through this, the scale extends beyond the measurement of attitudes and behaviors by offering a means to inform progress toward more sustainable practices. It also aligns with broader global priorities, particularly Sustainable Development Goals 11 and 12, which emphasize sustainable urban development and responsible patterns of consumption and production (United Nations, 2023).

CONCLUSION

The study presents a validated Hindi version of the Holistic Consumer-Centric and Value Co-Creation Scale for e-waste management, providing empirical support for its reliability and validity within the sampled population. The scale offers a structured way to examine how consumers perceive and engage with e-waste related practices, thereby contributing to a deeper understanding of responsible consumer behavior in this context. Further application of the scale across larger and more diverse populations would help strengthen its generalizability and practical relevance. Such efforts may support researchers, educators, and policymakers in developing more inclusive and context-sensitive strategies for improving awareness and participation in e-waste management.

LIMITATION

The findings of the study should be interpreted with certain limitations in mind. The validation of the Hindi version of the scale was carried out using a specific sample, which may not fully represent the diversity of perspectives and behavioral patterns across different regions and cultural contexts in India. Consequently, the findings cannot be generalized to all populations or settings.

Expanding the use of the scale to larger and more diverse samples across multiple geographical areas would help improve its broader relevance. In addition, adapting the scale into other regional languages could further improve its applicability and usefulness in India's multilingual research landscape.

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Long-Term Success Strategies for Incorporating Sustainability in Indian FMCG Sector

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ABSTRACT

It is now the moment, when organizations necessity sustainable marketing management that is why they have the need to reach out their drives of social change and environmental sustainability on one hand and of economic success. The FMCG industry in India is experiencing a revolution where sustainability is becoming the serious ingredient in driving long-term growth. Due to the increasing consumer alertness and stricter regulatory norms coupled with mounting environmental concerns; it has become imperative for FMCG organizations to deploy sustainability practices across their entire value chain. The study specifies that sustainable marketing would contribute to the longevity financial benefits to organizations, building customer loyalty and enhance their brand perception through its examination of real-world business situations as well as emerging market trends. The research reveals that organizations that really implement sustainable practices can actually achieve competitive advantage among the market, as well as contributing to a sustainable global economy. The research shows how government policy, technology and consumer behaviour all drive the development of sustainability strategies.

This paper examines some large FMCG corporations and their sustainability initiatives, highlighting what they are doing right and what issues they are facing in attempting to implement these projects. This research indicates that if these corporations concentrate on sustainability, such as developing green products, improving their supply chain, and being more transparent, they will probably experience increased brand loyalty, improved regulatory compliance, and increased profits compared to other corporations in the same industry. In summary, this research provides FMCG corporations with suggestions on how to move from short-term sustainability projects to comprehensive projects in India

Keywords: *Sustainability, FMCG, India, Circular Economy, Green Packaging, Supply Chain, Consumer Behaviour, Corporate Governance.*

INTRODUCTION

Sustainability has emerged as a crucial business strategy component for FMCG companies as their supply chain and customer base expose them to different operational challenges. In India, FMCG companies have started using sustainability practices as a competitive approach rather than considering them a compliance requirement. Environmental concerns and ethical product demands and government regulations have forced businesses to alter their marketing and product development approaches. The Indian Fast-Moving Consumer Goods (FMCG) industry has emerged as one of the most critical and rapidly growing markets due to growing

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consumer demand and market dynamics. Companies adopt sustainable green marketing strategies as a reaction to growing environmental concerns and government regulations that help them gain a competitive advantage. Sustainable green marketing is the approaches adopted by companies to market their green products as they attempt to reduce adverse environmental impacts and satisfy consumer demands for sustainable products. This study investigates how sustainable green marketing practices help Indian FMCG companies gain their competitive advantage by establishing brand reputation and increasing customer loyalty and ensuring regulatory requirements and promoting innovation.

2. THE NEED FOR SUSTAINABILITY IN THE INDIAN FMCG SECTOR

2.1 Rising Consumer Awareness

The Indian consumer is increasingly demonstrating an understanding of environmental and social issues that lead to their demand for sustainable products. According to a Nielsen report, 73% of Indian consumers favor brands that are environmentally responsible. FMCG companies are now under pressure to adopt sustainable practices in their entire product sourcing and packaging and waste management processes.

2.2 Regulatory Landscape

The Indian government has formulated several regulations to promote environmental responsibility, including: The Plastic Waste Management Rules (2016, amended 2021): This act bans the use of single-use plastics.

Extended Producer Responsibility (EPR): This act requires manufacturers to take responsibility for disposing of their products after consumers are done using them.

Corporate Social Responsibility (CSR) Mandates: This act requires companies to dedicate resources to sustainable development projects.

These regulations force FMCG companies to change their strategies for marketing and manufacturing their products.

2.3 Environmental Challenges

India faces serious environmental issues such as plastic waste and water scarcity. Since FMCG products generate huge plastic waste, it is necessary for companies to adopt eco-friendly packaging solutions.

3. SUSTAINABLE MARKETING STRATEGIES IN FMCG

3.1 Eco-Friendly Product Development

Through sustainable product development, companies develop new products that have fewer harmful chemicals and biodegradable ingredients and perform crueltyfree testing. The company Hindustan Unilever developed eco-friendly product options that include Lifebuoy soap made from natural ingredients.

3.2 Green Packaging and Waste Reduction

Most of the FMCG firms have started using sustainable packaging solutions that include biogradable materials and recyclable plastics and containers. Colgate Palmolive launched their bamboo toothbrushes and recyclable toothpaste tubes that reduce plastic waste.

3.3 Ethical Supply Chain Management

A sustainable supply chain functions through fair trade sourcing and carbon footprint reduction. The company that implemented sustainable sourcing practices in their supply chain is ITC Limited. The reason for this is that they ensure that their raw materials come from environmentally sustainable agricultural sources.

3.4 Transparency and Corporate Governance

Those brands that segment their sustainability events with the public figure trust with their customers. Companies today offer sustainability reports as the main way to prove their sustainability activities while engaging with the UN Sustainable Development Goals and ensuring transparent corporate governance.

3.5 Digital and Sustainable Advertising

FMCG brands engage digital platforms to decrease their dependence on traditional advertising, which is done using printed materials. Sustainable marketing campaigns employ social media platforms and influencers who indorse environmental awareness to attract customers. Nestlé India employs marketing campaigns that promote water conservation and plastic neutrality as part of their sustainability initiatives.

4. HOW GREEN MARKETING ENHANCES COMPETITIVE ADVANTAGE

4.1 Brand Differentiation and Consumer Preference

Going green can help a brand stand out, which draws in shoppers who care about value, like millennials and Gen Z. For example, Hindustan Unilever and ITC sell green products since more people want them.

4.2 Customer Loyalty and Trust

Green marketing can certainly help to build buyers' loyalty. People like brands that concern about being sustainable like Patanjali, Mama Earth they have built a super loyal fanbase by focusing on herbal, chemical free and sustainable stuff.

4.3 Cost Savings Through Sustainable Practices

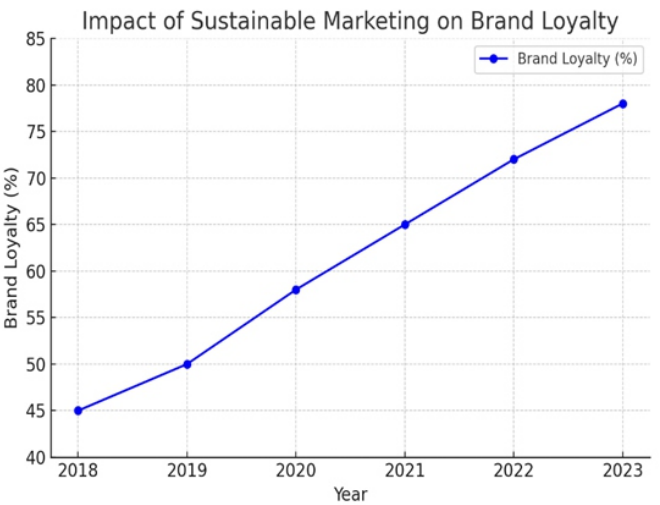
Green marketing assists in implementing cost-saving measures such as sustainable packaging, energy-efficient production processes, and waste management. ITC's "Wealth Out of Waste" movement, encouraging people to recycle products, assists in reducing costs associated with raw materials.

4.4 Regulatory Compliance and Risk Mitigation

Organizations, by incorporating sustainable practices, ensure that they are complying with the strict regulations and laws imposed by various environmental laws such as Plastic Waste Management Rules 2016 and EPR, which helps them avoid penalties and boosts their reputation.

4.5 Innovation and Market Expansion

Sustainability innovation leads to new products and new markets being created. Colgate Palmolive's Vedshakti, an ayurvedic toothpaste, is a prime example of a product that has utilized the growing trend for natural products, thus providing a chance for companies to reach new markets.



Source: - ITC Ltd Report -2022

5. OBJECTIVES

The present paper studies the underlines the following objectives

- Investigate the corporate sustainability practices of leading Indian FMCG companies, analyzing sectoral investments.
- Emphasize the need for corporate sustainability practices in the Indian FMCG industry, in light of the prevailing economic conditions.
- Examine and categorize the current sustainability tests and trends in the FMCG industry, with a focus on innovations and practices that improve environmental performance.

6. RESEARCH METHODOLOGY

This is a descriptive research study aimed at researching the corporate sustainability practices of the Indian manufacturing units using secondary research methods. The data was collected through the company's annual reports, newspapers, sustainability reports, disclosures, and the company website, focusing on the Corporate Social Responsibility practices in India.

7. CASE STUDIES OF SUSTAINABLE FMCG INITIATIVES IN INDIA

7.1 Hindustan Unilever Limited (HUL): Reducing Carbon Footprint

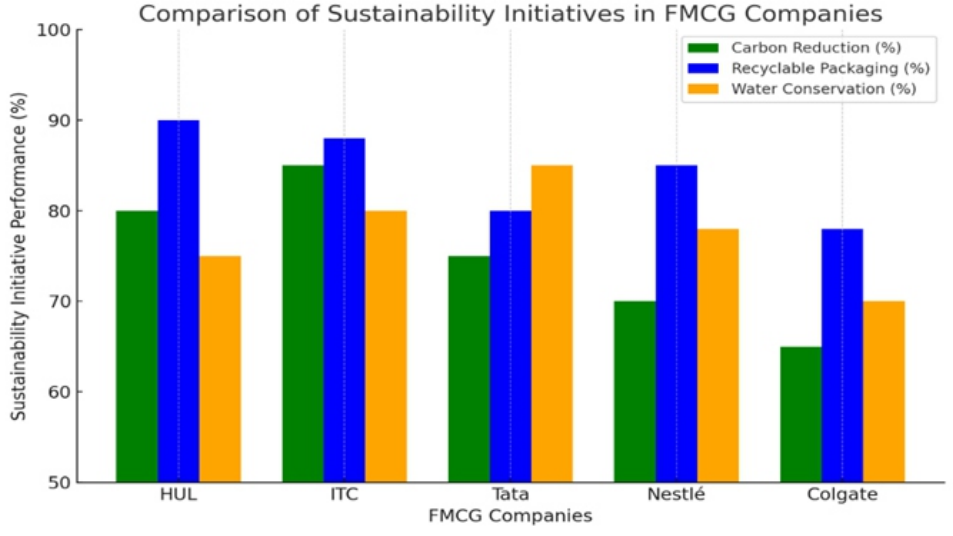
HUL has pledged to achieve net-zero emissions in its entire value chain by 2039. Its "SmartFill" project enables customers to refill their detergent packaging at specific retail outlets, thus decreasing plastic use.

7.2 ITC Limited: The Triple Bottom Line Approach

ITC adopts a Triple Bottom Line approach, which emphasizes economic, social, and environmental outcomes. Its "Well-being Out of Waste" initiative supports solid waste management and recycling.

7.3 Tata Consumer Products: Sustainable Sourcing

Tata Tea practices sustainable sourcing of tea leaves through its Trustea initiative, which has positively impacted tea farmers and encouraged environmentally sustainable tea cultivation practices.



Source: - Nielsen India. (2021). The Rise of Conscious Consumerism in India.

8. CHALLENGES IN IMPLEMENTING SUSTAINABLE MARKETING

Even with the upsides, FMCG companies in India have some issues when they try to use sustainable marketing:

- Big Start-Up Costs: It costs a lot to get eco-friendly products off the ground.
- Shoppers Watch Prices: Indian shoppers usually want cheap stuff over green stuff.
- Not Enough Recycling Stuff: Recycling and waste plants are still being built.
- Fake Green Stuff: Some companies trick shoppers into thinking they're eco-friendly, which hurts those companies in the end.

9. FUTURE OUTLOOK AND RECOMMENDATIONS

9.1 Government and Policy Support

The government also has a role to play in the promotion of sustainability in FMCG businesses. The government has to promote tax benefits for sustainable projects and support extended producer responsibility.

9.2 Technological Advancements

FMCG businesses can utilize the benefits of Artificial Intelligence (AI) and Blockchain technology to make the supply chain transparent and simplify the process of waste reduction. AI-based demand prediction can reduce wastage, which not only harms the environment but also increases costs.

9.3 Consumer Education

FMCG enterprises have to work to educate their consumers about the future benefits of sustainable practices. This can potentially be achieved through effective use of "storytelling," "labels," and "marketing.".

9.4 Holistic Sustainability Strategy

Organizations need to adopt sustainability as a part of their fundamental business strategy rather than engaging in it as a secondary project. The circular economy model, a strategy that seeks to eliminate waste while maximising the reuse of resources, can be a value-creating strategy.

10. CONCLUSION

The FMCG industry today is going through a major change as organizations realize the need to incorporate sustainability to build a better future. The new trends are changing the face of the FMCG industry by introducing new user engagement models, ideas in sustainable packaging, the circular economy, and creative product development. This change in the industry by adopting these new ideas may help the FMCG industry become a sustainable world by minimizing the impact of the industry on the planet and increasing brand loyalty.

The need of the hour has shifted from sustainable marketing to the 'must to' stage for the FMCG sector in India. Organizations are thereby focusing on green products, supply chain management, and corporate governance policies to build stronger brand loyalty, ensure regulatory compliance, and maximizing profitability. By moving away from sustainability initiatives to more 'holistic' sustainability approaches, the FMCG sector can move towards a more sustainable future. Hence, adding more sustainability to the Indian consumer market.

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Technological Advancement: A Study on Banking Sector in India

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ABSTRACT

Over the last few years it has been observed that banking sector of India has undergone with many upgradation and advancement, that especially help in global financial system. Indian banking system has introduced many innovative steps that aim to provide banking services to people, not availing such services. These steps include NEFT, RTGS, mobile banking, internet banking ATM, Retail banking, debit and credit card, 24/7 banking service that include chatbot which provide one to one advice as per the requirement of the customers. This paper highlighted the advancement in banking sector of India that not only benefited the sector but customers too. This study elaborate the efforts made by the banking sector towards the advancement that leads to growth and development.

Keywords: *Banking, Banking system, Advancement, Digital Banking and Development*

INTRODUCTION

Banking sector has undergone with many advancements throughout the era of advancement, especially after liberalization banking sector taking the advantages through the lowing entry barriers, competition has significantly increased new private sector banks entered the market between 1994 to 2000. Additionally, 20 foreign banks started their working since 1994. As far as technology concerned, it had started in early 1970s with introduction of automated system like SWIFT network for electronic payment, computerized banking and online banking feature enabled in late 1980s, mobile banking enabled in early 2000s, and in present day AI, machine learning, block chain and security has enabled.

Evolution in Technology in Banking

- Pre-Digitalization Era: It was a time when life was shaped by analog systems, physical interactions, and manual processes exists.
- Core Banking Solution: It is a network of bank branches that allow their customers to manage their bank account from anywhere, at any time.
- Automated Teller Machines: It is a computerized device and a boon for customers that enables them to withdraw money at anytime and anywhere with some certain free transactions. It is also convenient to carry, use and safe to assess.

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- Internet and Mobile Banking: Mobile banking and internet banking are both digital banking methods that allow you to access your accounts and perform transactions online. Mobile banking is done on a smartphone, while internet banking is done on a computer or laptop
- FinTech and AI Integration: Integrating AI in the FinTech sector has proven cost saving by decreasing operational costs spent on customers to provide them banking services, fraud prevention, clerical tasks and more. It can also improve customer experience by performing in-depth analysis on investment and insurance.

IMPACT OF TECHNOLOGICAL ADVANCEMENTS

- Financial Inclusion: Financial inclusion is one of the initiative that enables savings, credits and insurance services to vulnerable and low income groups by government and RBI. It leverages services UPI, Aadhaar to foster economic growth. This advancement not only benefited individual but economy as a whole.
- Operational Efficiency: It has improved the efficiency of banking services provided to its customers that leads to customer satisfaction. This leads to competitiveness and profitability.
- Customer Experience: Customers can avail banking services by 24*7, personalized banking services, chatbots has enhanced their satisfaction.
- Security Enhancements: It has enhanced security in transactions, identifying frauds, preventive measures, early recognition of defaults.

CHALLENGES IN ADOPTING BANKING TECHNOLOGY

- Cybersecurity Risks: As we become digitalized, many frauds took place, like fraud with ATM, UPI, Internet banking, mobile banking, Aadhaar and bank account.
- Digital Divide: It might create a gap between generation that use technology. Many of old age do not want to use these technology because of these frauds.
- Regulatory Compliance: Regulatory compliance is the process of adhering to laws, regulations, standards, and other rules set forth by governments and other regulatory bodies. Sometimes it become a challenge for bank to maintain and complete the task. It is an important aspect of doing financial buisness to follow certain laws and regulations to maintain their operations.
- Infrastructure Limitations: Infrastructure limitations can include scalability issues, environmental impact, technological challenges, and cost overruns.

FUTURE TRENDS IN BANKING TECHNOLOGY

- Artificial Intelligence & Machine Learning: Artificial intelligence (AI) is a broad concept, and machine learning (ML) is a subset of AI. AI is the ability of a machine to learn, reason, and act like a human, while ML is a way to teach machines to perform tasks by analyzing data.
- Blockchain & Cryptocurrency: Blockchain is a digital ledger that records transactions, while cryptocurrency is a digital currency that uses blockchain technology.
- Neobanking & Open Banking: Neobanking and open banking are both transforming the banking industry, with neobanks offering digital-first services and open banking enabling data sharing.
- 5G & IoT in Banking: can work together to improve banking services by enabling faster transactions, enhanced security, and better customer experiences.

Objective of the study:

1. To understand the evolution of technology advancement and its impact.
2. To analyze the challenges to implement the advancement in banking sector.
3. To know the customer perception towards using the innovative technology in banking.

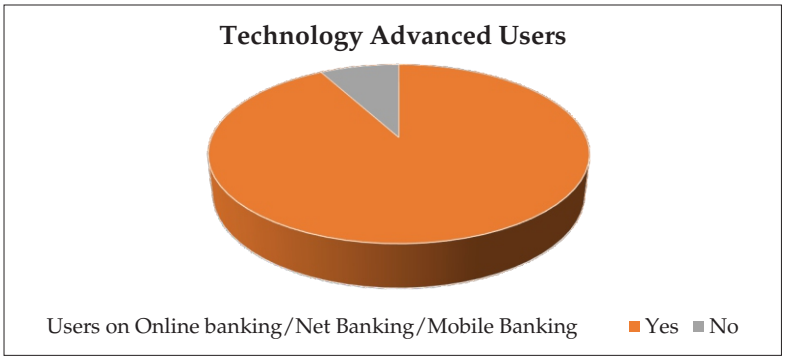
RESEARCH METHODOLOGY:

This research is descriptive and analytical, collected primary and secondary data on technology and innovations adopted by banks of India. Finding and conclusions of the study is based on adopting technologies by time and also by collecting data from the users by structured questionnaire. The primary data was collected by structured questionnaire and collected by 50 respondents. The researcher had gone through the academic literature available and also from various sources of secondary data were used for the study.

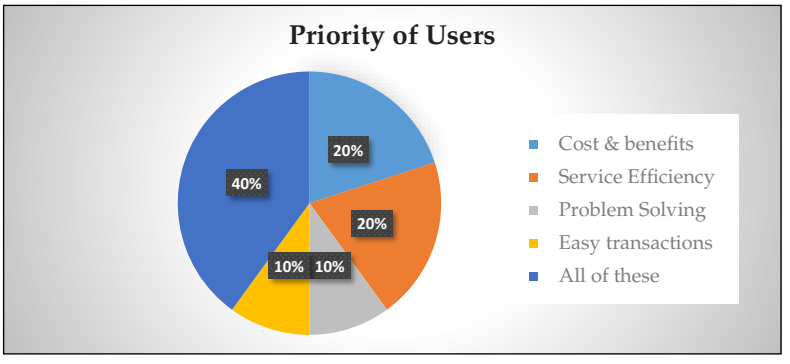
Literature Review: Private and foreign sector banks has invested in technology but public sector banks need to invest (Megha D. Shetty 1 & Nikhitha M. K 2022). Financial innovations lower cost of capital, reduce financial risks, improve financial intermediation, and hence welfare enhancing (Gowripeddi hari kumar 2022). Financial innovation is helpful in ensuring smooth functioning and improves the overall efficiency of the system by minimizing cost and reducing risk of fraud. More generally, financial innovation has been a central force driving the financial system toward greater economic efficiency (Merton and Bodie 2005). Advancement in technology are set to change the face of banking business. Advancement in banks has transformed the retail banking that increased the chance of profit. The Indian banking sector has developed, but customers of banking services have not yet fully followed the new path of banking. Over time, awareness about banking services among customers improves and leading to a better acceptance of the advanced banking (Avasthi & Sharma 2000-01).

Analysis:

1. Technology Advanced Users: There are 92% of account holders are availing the online, Net banking and Mobile Banking users and only 8% are not availing this facility, this might be possible that users are afraid of fraud, cyber-crime or scams in bank.



2. As per the study, found that the technology helps and prioritized the users by cost efficient, user friendly, problem solving any time and service efficient.



FINDINGS

As per the study, researcher found that there are many advantages of advancements and innovations in banking sector, it also makes functioning of banks more convenient to use. It is also found by the primary study that maximum account holders use online banking, mobile banking and net banking, found it more efficient method of work, cost effective etc.

CONCLUSION

Technological advancements have revolutionized the Indian banking sector by improving accessibility, security, and efficiency. However, challenges such as cybersecurity threats and digital literacy need to be addressed to ensure sustainable growth. With continued innovation and regulatory support, the Indian banking sector is poised for a tech-driven future.

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The Impact of Diversity on Organizational Performance: An Overview

Jyoti*
Dr. Aarti Garg**

ABSTRACT

These days, diversity in the workplace is crucial to any successful organization. Diversity is essential to success in today's international corporate environment. This research looks at how fundamental dimensions of organizational success, including innovation, financial performance, employee happiness, and decision-making, are influenced by diversity. It demonstrates how diverse teams foster innovation and problem-solving, which gives them an advantage over rivals, by using current research and real studies. Businesses have a number of difficulties while implementing diversity initiatives, including prejudice, a lack of communication, and resistance to change. The conclusion of the research presents strategic advice for establishing an inclusive workplace that optimizes the benefits of diversity while minimizing any possible downsides.

Keywords: *Organisational success, Equity, Diversity and performance.*

INTRODUCTION

Diversity may appear to be both challenging and fresh at times, yet it is neither. In recent years, workplace diversity appears to have increased significantly. Workplace diversity has emerged as a competitive advantage in the fast-paced commercial world of today. Businesses can handle difficulties more imaginatively and make better judgments when they have a range of opinions. Race, gender, age, sexual orientation, ethnicity, and cultural background are some of the traits that lead to diversity. While some firms struggle to develop inclusive cultures, others flourish by incorporating diversity into their basic principles and execution methodologies. This article examines how diversity affects organizational performance and describes how businesses may maximize the benefits of employing a diverse workforce.

RESEARCH METHODOLOGY

- **Approach:** This study is based on a review of existing literature, empirical research, and case studies on diversity in organizations.
- **Data Sources:** Academic journals, business reports, and industry case studies.
- **Analysis Framework:** The framework for analysis involves assessing how diversity affects decision-making, employee satisfaction, financial performance, and innovation.

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- **Limitations:** Differences in diversity implementation across industries, possible biases in case studies, and a lack of up-to-date organizational data.

OBJECTIVE OF THE STUDY

- Analyze how workplace diversity affects the effectiveness of the company.
- Examine how workplace diversity affects the effectiveness of the company.
- Identify the problems that organizations run across when putting diversity programs into action.
- Provide examples for effective strategy implementation for creating a fostering workplace.

SCOPE OF THE STUDY

The study examines the impact of workplace diversity on the performance of organizations, covering key areas such as success, employee happiness, innovation, and decision-making. The scope of the study covers the following:

1. **Theoretical and Empirical Analysis:** The study employs case studies, literature, and empirical research to examine the impact of diversity on the effectiveness of organizations.
2. **Dimensions of Diversity:** Examining the effects of age, gender, ethnicity, culture, and functional knowledge on performance.
3. **Opportunities and Challenges:** Recognizing challenges and barriers to the implementation of diversity initiatives, such as unconscious bias, communication barriers, and resistance to change.
4. **Strategic Implications:** Diversity training, mentorship initiatives, strategies for leaders, and data-driven approaches are all recommended to create an inclusive workplace**.**
5. **Industry Perspectives:** Examining the implementation and effectiveness of diversity initiatives in other firms.
6. **constraints:** Recognizing constraints such as industry-specific differences in managing diversity, lack of up-to-date information, and potential biases in case studies.

EFFECTS OF DIVERSITY ON ORGANIZATIONAL PERFORMANCE

1. **Creativity and Innovation:** Diverse teams foster creativity and innovation by allowing people with different experiences, views, and approaches to problem-solving to come together. It has been found that more diverse businesses are more creative because they have different perspectives that offer novel ideas and innovative solutions.
2. **Job Satisfaction and Retention:** Employees who are part of an inclusive workplace are more satisfied and content. Employees are more likely to remain with their organization if they feel valued and included, which results in a positive work environment.
3. **Financial Performance:** Research has found that organizations that have diverse leadership teams perform better financially than those that lack diversity**.**
4. **Decision-making and problem-solving:** Teams with diverse members are better at problem-solving because they take into account a range of perspectives before reaching a decision. Diverse perspectives may initially cause conflicts, but effective teams capitalize on these differences.

CHALLENGES OF DIVERSITY PROGRAMS IMPLEMENTATION

- Managers and employees may oppose diversity programs since they feel threatened by the change in the status quo. Despite the advantages of diversity, firms face a number of challenges in the process of implementing diversity programs.

- Lack of communication among employees may result from cultural and linguistic differences.
- Differentiation and Discernment: Recruitment and promotion programs may be undermined by implicit biases, leading to a discriminatory workplace.

Techniques for Maximizing Diversity

Organizations can maximize the advantages of diversity by implementing the following techniques:

1. **Inclusive Leadership:** Leaders should promote diversity, set goals, and create a respectful workplace.
2. **Bias Training:** Employees who are trained on implicit biases are better placed to handle the issue of bias.
3. **Mentorship and Sponsorship Programs:** By mentoring, minority employees can advance in their careers and retain their positions.
4. **Data-Driven Approaches:** Organizations can always improve their diversity programs by analyzing data and evaluating the effectiveness of the programs.

ROLE OF DIVERSITY ON ORGANISATIONAL PERFORMANCE:

1. **Promoting Originality and Creativity**

   A feeling of belongingness is encouraged in diverse organisations, which enhances job satisfaction and reduces turnover. The organisational culture is enhanced by the inclusion of employees and their values.
2. **Improving the Financial Results**

   Diverse leadership teams outperform and outlast their less diverse counterparts, and studies indicate that diversity enhances equity returns and sales.
3. **Improving Decision-Making and Problem-Solving:**

   Diverse teams take into account various perspectives, resulting in better decision-making. Although there are initial conflicts, diverse teams managed effectively use differences to arrive at the best solutions.
4. **Overcoming Challenges and Obstacles:**

   Although it has advantages, diversity faces challenges such as racism, communication, and change management.

   To overcome biases, companies need to focus on training, mentoring, and inclusive leadership approaches.
5. **Establishing a competitive advantage:**

   Embracing diversity in core values gives a competitive advantage in the global corporate world.

   A diverse workforce enhances malleability, customer service, and corporate image.
6. **Supporting Inclusive Leadership**

   Leadership plays a pivotal role in supporting diversity and establishing inclusion goals.

   Inclusive leadership is based on respect, teamwork, and diversity.
2. **Gender Diversity**

   Gender diversity has been shown to be associated with better company governance and financial results. Companies with more female board members reported greater equity and return on sales. Female board members are also more likely to question CEOs for poor financial performance, and they also attend more board meetings. With just 12.5% female fund managers globally, the investment management business still faces a gender imbalance, underlining the importance of more comprehensive diversity initiatives.
3. **Ethnic and Cultural Diversity**

   Ethnic and cultural diversity is a rich source of viewpoints that can add to one's capacity for creativity and problem-solving. Studies have discovered a strong correlation between ethnic diversity and scientific

output, with ethnically diverse teams achieving more original and enduring work. However, inclusive practices and a culture that recognizes the value of contributions from diverse individuals can mitigate the advantages.

4. **Functional Diversity**

Functional diversity is a type of diversity that pertains to the different skills and professional expertise of a team. This diversity can result in more innovative and holistic strategy. Studies have demonstrated that teams with diverse knowledge and skills achieve more innovative and enduring work, especially in scientific and technological fields. Leadership is critical.

FINDINGS OF THE STUDY

- Diversity in organizations encourages innovation and creativity, providing a competitive advantage. Inclusive settings result in higher employee satisfaction, retention, and reduced turnover costs.
- Multiple teams improve decision-making and problem-solving by considering diverse viewpoints.
- Unconscious bias, communication barriers, and resistance to change might hinder the success of diversity initiatives, despite their benefits.
- Diversity practices such as mentoring, bias training, and inclusive leadership, when adopted, ensure an inclusive culture and achieve the best results.

CONCLUSION

Diversity is both a business and moral necessity. Organizations that embrace diversity, equity, and inclusion have seen increased innovation, financial success, and employee satisfaction. But to implement diversity initiatives, one must overcome stereotypes, create inclusive leadership, and create strategies to effectively utilize diversity. Organizations that adopt an inclusive culture can put themselves on the path to success in this increasingly globalized world.

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Role of Delivery Partners on Repeat Purchase Intentions in OFDAs – A Study in Moradabad Region

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ABSTRACT

This study intends to explore the role of delivery partners in shaping the repeat purchase intentions among the users of online food delivery app, residing in Moradabad, a growing tier-2 city in India. Drawing from a study done on 153 customer responses, it examines the five key factors viz. delivery speed, partner professionalism, food condition on arrival, problem resolution, and hygiene practices. In the study correlation analysis and multiple linear regression are used and it was found that courteous interactions significantly boost customers' willingness to reorder, while perceived hygiene unexpectedly showed a negative relationship with repurchase intent of customers, creating an opportunity for further deliberation and research. Other factors like speed and order accuracy showed no notable impact on the dependent variables.

These insights highlight the importance of human touch in last-mile delivery as critical for loyalty in emerging markets, urging platforms to prioritize partner training. The study bridges a research gap in non-metro contexts, where researches are scant in this domain and thus offering practical guidance for OFDA operators.

Keywords: *Delivery partner service quality, Repeat purchase intention, Online food delivery apps, Last-mile delivery*

INTRODUCTION

The rapid growth of online food delivery applications has fundamentally reshaped how consumers dine, signalling a major shift in the food service industry all over the world (Suhartanto et al., 2018). This sector has gained momentum and has expanded quickly; especially in developing economies like India, where online food delivery (OFD) services are gaining popularity attributable to the convenience it provides, ease of use, and increasing trust in digital payment systems (Alghamdi et al., 2023; Siddiqi et al., 2024). Amid a very highly competitive environment in modern times, building customer loyalty and encouraging repeat purchase intentions of the customers are essential for the long-term success of OFDA platforms (Chan et al., 2023; Suhartanto et al., 2018).

Many studies have already been done on the overall service quality in context of OFDAs (Wu et al., 2024), the role of last mile delivery partners in specific has not been explored much (Khan et al., 2024). Delivery partners play a key role in creating the customer experience, and their performance directly influences customer satisfaction and the chances of making them buy again (Ismail et al., 2024; Mao et al., 2019). While efficient and fast speed are crucial factors to ensure customer satisfaction and ensure their retention (Ismail et al., 2024),

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professionalism and style of interaction possessed by delivery personnel including their friendliness and skills to communicate, are key determinants of overall experience of the customer (Macías et al., 2023). Also important is to maintain food integrity at the time of delivery and to ensure that the correct order is delivered (Khan et al., 2024). Also, policies pertaining to service recovery are crucial for providing effective resolutions to customer problems (Macías et al., 2023). Multiple studies have reiterated the importance of strict hygiene practices in crafting perception of customers about safety of food and the overall service quality of OFDAs (Christian et al., 2023; Rui et al., 2025).

The study presented here, tends to focus on the various dimensions related to the delivery partner assigned with the task of delivery of food at last mile. This work tends to examine the role of various attributes related to delivery partner in influencing the repeat purchase intentions of customers in the OFDA sector in Moradabad region. Specifically, it investigates how delivery efficiency and speed, customer interaction and professionalism, food integrity upon arrival and order accuracy, problem resolution efficiency, and hygiene practices affect consumer decision-making and more precisely the repeat purchase behavior in this emerging Indian market. Both, descriptive and inferential statistical tools are employed to achieve the objectives of the study.

India has witnessed changes in lifestyle of its people, increased use of smartphones and urban people having started seeking convenience. All this contributing to massive growth of online food delivery sector in India. (B & Andrew, 2021; Chanda & Priyamvada, 2025; Gupta & Nair, 2021). This unprecedented growth has enabled leading players like Swiggy and Zomato to emerge as major game changers and thus restyling the eating habits of the society and the entire food service industry (Chandan, 2020; Gupta & Nair, 2021). This radical shift has provided an alternative and moved many if not all; customers relying on restaurants to these tech assisted delivery platforms. Thus, making food delivery partners, critical touchpoints in the overall service encounter (M. Z. Khan, 2023; Mohd. A. Khan & Maqbool, 2024). These OFDAs can become financially sustainable and remain competitive; only if and when they are able to encourage repeat purchase and garner loyalty from their customers (Chan et al., 2023; Gao et al., 2024; Khan et al., 2024).

While, lot many studies have been done in the domain of OFDAs over the last few years, studies focused on emerging Tier 2 and Tier 3 markets have been scarce; particularly in reference to delivery partner–specific factors and the way they are shaping customer satisfaction and repeat purchase behaviour (Kaur, 2023; Khan & Maqbool, 2024; Rishi et al., 2021). This study is an attempt to address this gap by examining the role of delivery partners in driving repeat purchase intentions in Moradabad region. It is a relatively under-studied tier-2 city, and learnings from markets like this can serve as a guiding reference for developing customer retention strategies in similar markets.

REVIEW OF LITERATURE

Online Food Delivery Services in India

Change in lifetsyles, growing smartphone adoption and usage and need for convenience have been the drivers behind the rapid growth of online food delivery sector in India (Chanda & Priyamvada, 2025; Gupta & Nair, 2021). The pattern is quite evident in the urban Indian geography because of busy routines and high disposable incomes This shift is particularly evident in urban areas, where for every day meals, the reliance of food delivery apps has gone up because of busy routines and higher disposable incomes (B & Andrew, 2021; Gupta & Nair, 2021). These OFDAs offers a vast range of restaurant options to choose from along with sales promotion deals, plethora of payment gateway options; all resulting in alteration of conventional eating habits of people (-, 2023; Chanda & Priyamvada, 2025). This gush in OFDA adoption among people can be largely attributed to the convenience, attractive discounts it offer, improved quality of service, better reliability of food delivery applications, efficiency in fulfilment of orders and flexibility in payment options; offered by these applications

(Chandan, 2020; Pandey et al., 2021). The pandemic of 2020 and its aftermath, has also accelerated this transition and has established OFDAs as an indispensable part of everybody's life (Chanda & Priyamvada, 2025).

In the light of this knowledge, it becomes lot more important to meticulously plan the ecosystem involved as it impacts the efficiency in logistics, attract and retain customers through high quality service and on time deliveries (Datta, 2018). With such a delivery model cementing its place in the ecosystem thus evolved, OFDAs have this responsibility of providing logistical support and delivery of food directly to the customers who have placed orders (Natarajan et al., 2019). It implies, that delivery partners employed at the last mile are in the centre of the operations of OFDAs and handling the large part of their order fulfilment (Khan & Maqbool, 2024).

Delivery Partner Service Quality Dimensions

The perceived quality of services offered by these delivery agents or partners, determines satisfaction of the customers and their overall experience with the OFDA (Wu et al., 2024; Yusra et al., 2020). Several important aspects and dimensions related to services provided by delivery partner have been learnt and highlighted from the literature available, as here under:

- **Delivery efficiency and speed:** Delivery of food within the reasonable exepectation of the customers is crucial to customer satisfaction and his future intentions to order online (Ismail et al., 2024; Shipman, 2020). Customers opt for OFDAs primarily to get convenience and save time; and therefore, expects the delivery partner to arrive with order before or with in the time frame promised by the OFDAs (Kajandren et al., 2023; Shipman, 2020). A study states that any delays in the last mile delivery will adversely impact customer satisfaction (Ismail et al., 2024), as almost every customer expects quick order fulfilment and expect OFDA to comply the promised time frame of delivery (Kajandren et al., 2023). A study also revealed that clear explanation given by the delivery partners or agent in case of delay, helps minimize the customers' perceived dissatisfaction (Bonfanti et al., 2023). It is learnt in a study that efficiency in food delivery shapes customers' evaluation of the service offered by the OFDA (Ismail et al., 2024).

- **Customer interaction and professionalism:** A recent study revealed that the manner in which the delivery partner has behaved and his appearance, style of communication and mannerism influences customers' perceptions and satisfaction (Macías et al., 2021, 2023). Consumers value professionalism, and tangible cues such as uniforms help builds trust in customer towards the services offered (Macías et al., 2023). Trust and overall satisfaction with the OFDAs have resulted from positive and respectful interactions with the delivery partners of OFDAs (Wu et al., 2024). Degree of empathy and the willingness of the agents to assist the customers during the service encounter has a positive bearing on the perceived service quality of OFDAs (Yusra et al., 2020).

- **Food integrity upon arrival and order accuracy:** Positive conformation of service quality highly depends on 2 factors viz. correctness of the food (order) delivered and its condition (Khan et al., 2024). If a wrong item is delivered or is missed or arrives in a condition not fit for consumption; dissatisfaction, negative reviews, damage to the reputation of OFDAs and decline in sales follows (Khan et al., 2024; Shipman, 2020).

- **Hygiene and safety practices:** As awareness towards health and safety has increased, in the aftermath of global health crises, the hygiene and safety practices of delivery partners makes an important part of customers' evaluations (Nizar & Abidin, 2021). Quality of packaging. handling of food parcel and delivery experience of customers, serves as an indicator of food safety in the eyes of the customers (Sarwar et al., 2020). A study also helped us understand, that the cleanliness and neat appearance of delivery partners or agents can potentially influence perceptions of meal hygiene (Saleh et al., 2024).

Repeat Purchase Intention

Repeat purchase intentions can be described as the willingness of customers to continue choosing the same product or service provider in future (Coşar et al., 2017). Repeat purchase intentions are crucial for long term sustainability and financial performance of OFDAs (Gao et al., 2024; Khan et al., 2024). Loyal customers ordering again from the OFDA are valued for their low cost of customer, faster purchase decisions and thus contribution to the overall profitability of the service provider (Munir et al., 2025). Past experiences, interactions and satisfaction resulting from them are important predictors of customers' repeat purchase intentions (Coşar et al., 2017; Munir et al., 2025). In one specific study, it was found that positive past experiences foster customer loyalty (Alauddin & Akther, 2023; Munir et al., 2025).

Research Gap

While many studies have been done in the domain of Online Food Delivery, covering the wide range of related aspects, some niche areas remain under explored and needs scholarly exploration. What accentuates the need is the scarcity of studies done in the geography and market like this region viz. Moradabad region:

- **Over-reliance on SEM in prior studies:** Across studies, higher order tools like SEM and PLS have been used to explore interrelationships of various factors in the ecosystem of OFDAs and uncover latent knowledge. While it is always valuable to use such tools and heightened methodology, the research focus gets narrowed inadvertently (Christino et al., 2021; Macías et al., 2023).
- **Lack of region-specific, descriptive evidence:** A large number of research studies done in OFD sector, have been done in Indian metros and Tier – I cities and a clear gap exist in the form of unexplored tier III towns and cities like Moradabad. (Vinish et al., 2021a, 2021b). The local socio-cultural landscape economic conditions and demography create a unique context which has direct bearing on the food consumption behaviour of people; thus, demanding a study focused on this part of the geography. (Vinish et al., 2021). Similar assertion came from another study where it was understood that models developed or tested in one setting may not apply to another geographical set up like tier-II or III towns (Dasgupta et al., 2021).

The present study is in line with the aforesaid gaps and thus by focusing on Moradabad, a specific tier-2 city in India, helps to bridge them. Both descriptive and inferential statistical techniques have been used and insights generated are not only important in practice across OFD sector; yet conceptually robust.

RESEARCH OBJECTIVES

The present study attempts to achieve the following objectives pertaining to delivery partner related dimensions, in Moradabad region. The study focuses on the possible impact of these dimensions on the repeat purchase intentions of those who have ordered at least once from the OFDA in Moradabad. The study seeks to uncover answers to the following:

1. To assess the impact of customer's perceived level of efficiency and speed of order delivery on repeat purchase intentions among OFDA customers in Moradabad.
2. To evaluate the impact of customers' perception of quality of customer interaction and degree of professionalism demonstrated by delivery partners on repeat purchase intentions of OFDA customers in Moradabad.
3. To investigate the impact of customers' perception of food integrity at the time of delivery and order accuracy on repeat purchase intentions of OFDA customers in Moradabad.
4. To investigate the impact of customers' perception of problem resolution efficiency of delivery partners on repeat purchase intentions of OFDA customers in Moradabad.

5. To investigate the impact of customers' perception of hygiene practices of delivery partners on repeat purchase intentions of OFDA customers in Moradabad.

RESEARCH HYPOTHESES

Delivery of order (food parcel) on time is vital for satisfaction of customers in online food delivery. Any delay is likely to have a detrimental impact on customer experience (Ismail et al., 2024). In another study the authors found that customers consider swift service valuable and thus effective management of expectations rest on punctuality of the delivery partner and transparency in communication (Bonfanti et al., 2023; Kajandren et al., 2023).

H1: Delivery efficiency and speed will positively impact customer repeat purchase intentions

The degree of professionalism demonstrated by the delivery personnel at the time of delivery including their appearance and communication efficacy influences the perception created in the mind of the customer (Macías et al., 2021). Customers appreciate when delivery partners are able to demonstrate a high level of professionalism with them and their positive interactions are crucial for building trust and enhance their satisfaction with the online food delivery platform (Macías et al., 2023; Wu et al., 2024).

H2: Customer interaction and professionalism of delivery partners will positively impact customer repeat purchase intentions

Another fundamental aspect of service quality and an inherent need of customers in reference to food delivery is that, the same item (dish) is delivered and is received at the time of delivery in desired state and condition (Khan et al., 2024). In their work researchers found that food quality negatively conforming to customers' expectations or inaccurate orders leads to dissatisfaction and adversely impacts their overall perception of service (Chan & Gao, 2021; Shipman, 2020).

H3: Food integrity upon arrival and order accuracy will positively impact customer repeat purchase intention

In an event of service failure, an effective service recovery mechanism may come to rescue and can be decisive in retaining customers (Macías et al., 2023). Complaints, if handled promptly and satisfactorily reflects OFDAs commitment to providing quality and can mitigate any negative impact.

H4: Problem resolution efficiency will positively impact customer repeat purchase intentions

The customers have increasingly become aware about their health and it has resulted in them being concerned about the hygiene practices of food delivery partners (Nizar & Abidin, 2021). It was learnt by researchers that cleanliness of delivery personnel and handling of the parcel is often seen as proxy of food safety (Saleh et al., 2024; Sarwar et al., 2020).

H5: Hygiene practices of delivery partners will positively impact customer repeat purchase intentions

RESEARCH METHODOLOGY

A cross-sectional study was done in Moaradabad region using quantitative instruments, to examine the inter dependency of delivery partner related service quality dimensions and customers' repeat purchase intentions in the online food delivery application (OFDA) sector. In this descriptive study a causal-comparative approach is used to capture consumers' perceptions and to test the proposed hypotheses through empirical evidences (Khan & Maqbool, 2024; Macías et al., 2021).

The respondents' profile was defined as any adult customer of OFDA living in Moradabad region who have used OFDAs. Convenience sampling was used to gather 153 valid responses (Khan & Maqbool, 2024).

A structured questionnaire adopted from past studies was used to collect the data and to ensure content validity of the instrument (Chan & Gao, 2021; Khan et al., 2024). A 5-point Likert Scale using continuum of Strongly Agree to Strongly Disagree was used for all the items to measure the constructs (IDVs) (Macías et al., 2021). Independent variables studied includes Delivery efficiency and speed, customer interaction and professionalism, food integrity upon arrival and order accuracy, problem resolution efficiency, and hygiene practices. Dependent variable in the study was Repeat Purchase Intention of customers who have ordered at least once from any OFDA in Moradabad region.

Correlation analysis was used to test the strength and direction of relationship among the IDVs and also with the DV. The Pearson's Correlation Coefficient from the correlation matrix created; helped in assessing the strength and direction of linear relationships between the five independent variables and the dependent variable (Vinish et al., 2021). The coefficient helped in ascertaining if the dimensions were significantly associated with the dependent variable repeat purchase intentions, or not. (Wu et al., 2024).

To test the proposed hypotheses and check for any causal effect of delivery partner related service quality dimensions (5 independent variables) on repeat purchase intentions of the customer multiple liner regression was used.

RESULTS AND FINDINGS

To summarize and draw inferences from the statistical analysis conducted on the data collected from the respondents, mean score was calculated for all the delivery partner related constructs (IDVs) Mean score of all the independent variables was calculated through SPSS, by running mean for the item scores. As learnt from the result tables, with a Mean Score of 4.0 respondents were found having high repeat purchase intentions. Attributes of service delivery partner received mixed scores. While efficiency in delivery and its speed along with customer interaction and professionalism were found with high mean scores of 4.07 and 3.97 respectively; the other remaining 3 constructs viz. hygiene practices of the delivery partner, food integrity upon arrival and accuracy of orders had relatively small scores.

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Mean Score of Delivery Efficiency and Speed	153	3.00	5.00	4.0654	.36699
Mean Score of Customer Interaction and Professionalism	153	3.25	4.50	3.9739	.31825
Mean Score of Food Integrity upon Arrival and Order Accuracy	153	2.00	4.25	3.3644	.38151
Mean Score of Problem Resolution Efficiency	153	2.67	5.00	3.8889	.44096
Mean Score of Hygiene Practices	153	2.25	4.25	3.2859	.36771
Mean Score of Repeat Purchase Intention	153	3.00	4.75	4.0016	.37003
Valid N (listwise)	153				

After this study it was learnt that customer interaction and professionalism demonstrated by the delivery partners have a significant positive correlation (r=0.196, p=0.015) with the repeat purchase intentions of the

customers in Moradabad. Challenging the initial view of the author, the study suggests that the hygiene practices of the delivery partners was found to have significantly negative correlation (r=−0.194, p=0.016) with the repeat purchase intentions of the customers. It was also learnt that the other 3 factors viz. delivery efficiency and speed, food integrity and order accuracy along with problem resolution efficiency of the delivery partners were found having no significant correlation with the repeat purchase intentions of the customers. All these 3 factors got p value greater than .05 level.

Correlations

		Mean Score of Delivery Efficiency and Speed	Mean Score of Customer Interaction and Professional-ism	Mean Score of Food Integrity upon Arrival and Order Accuracy	Mean Score of Problem Resolution Efficiency	Mean Score of Hygiene Practices	Mean Score of Repeat Purchase Intention
Mean Score of Delivery Efficiency and Speed	Pearson Correlation	1	.120	.096	-.046	-.021	.023
	Sig. (2-tailed)		.138	.238	.570	.801	.774
	N	153	153	153	153	153	153
Mean Score of Customer Interaction and Professionalism	Pearson Correlation	.120	1	.059	.014	-.161*	.196*
	Sig. (2-tailed)	.138		.471	.860	.047	.015
	N	153	153	153	153	153	153
Mean Score of Food Integrity upon Arrival and Order Accuracy	Pearson Correlation	.096	.059	1	-.038	-.056	.071
	Sig. (2-tailed)	.238	.471		.641	.493	.380
	N	153	153	153	153	153	153
Mean Score of Problem Resolution Efficiency	Pearson Correlation	-.046	.014	-.038	1	-.094	-.012
	Sig. (2-tailed)	.570	.860	.641		.250	.880
	N	153	153	153	153	153	153
Mean Score of Hygiene Practices	Pearson Correlation	-.021	-.161*	-.056	-.094	1	-.194*
	Sig. (2-tailed)	.801	.047	.493	.250		.016
	N	153	153	153	153	153	153
Mean Score of Repeat Purchase Intention	Pearson Correlation	.023	.196*	.071	-.012	-.194*	1
	Sig. (2-tailed)	.774	.015	.380	.880	.016	
	N	153	153	153	153	153	153

*. Correlation is significant at the 0.05 level (2-tailed).

To calculate and to examine the role of delivery partner related dimensions taken as IDVs in this study on the repeat purchase intentions of the customer in OFDAs in Moradabad region; multiple linear regression was applied. IDVs in this study includes, delivery efficiency and speed, customer interaction and professionalism, problem resolution and efficiency, food integrity and order accuracy & hygiene practices of the delivery partner. The sample and its subsequent analysis made us infer that delivery efficiency and professionalism, problem resolution efficiency of the delivery partner of OFDAs and the food integrity of parcel and order accuracy were found having no significant individual effect on the repurchase intentions of customers. With p value of .041 and -0.168 as B value, factor 'hygiene practices' was found having significant but inverse relationship with repeat purchase intention of customers. 'Customer interaction and professionalism' was found to have a significant positive impact on repeat purchase intention of customers. The p value for this predictor was .041 which was less than .05 and B value was .0.194. With p values of 0.519, .721 and .936, 'food integrity and order accuracy', 'problem resolution efficiency' and 'delivery efficiency and speed' were found having no significant role as predictors of repeat purchase intention of customers. With Variance Inflation Factor (VIF) values hovering around 1.0 for all the predictors, it can be safely inferred that there was no multicollinearity amongst the predictors.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1.	(Constant)	3.731	.687		5.432	.000	2.374	5.089		
	Mean Score of Delivery Efficiency and Speed	-.006	.081	-.006	-.080	.936	-.167	.154	.976	1.025
	Mean Score of Customer Interaction and Professionalism	.194	.094	.167	2.058	.041	.008	.381	.959	1.043
	Mean Score of Food Integrity upon Arrival and Order Accuracy	.050	.078	.052	.647	.519	-.103	.204	.985	1.015
	Mean Score of Problem Resolution Efficiency	-.024	.067	-.029	-.358	.721	-.157	.109	.987	1.013
	Mean Score of Hygiene Practices	-.168	.082	-.167	-2.058	.041	-.329	-.007	.963	1.038

a. Dependent Variable: Mean Score of Repeat Purchase Intention

Thus, the hypotheses statements proposed earlier can be concluded in the following manner:

- H1: Delivery efficiency and speed have been found to have no impact on repeat purchase intention of the customers. The hypotheses was not supported in statistical analysis.
- H2: Customer Interaction and Professionalism have been found to have no impact on repeat purchase intention of the customers. The hypotheses was not supported in statistical analysis.
- H3: Food Integrity upon Arrival and Order Accuracy have been found to have no impact on repeat purchase intention of the customers. The hypotheses was not supported in statistical analysis.
- H4: Problem Resolution Efficiency have been found to have no impact on repeat purchase intention of the customers. The hypotheses was not supported in statistical analysis.
- H5: The predictor hygiene practices was found to have inverse relationship with the dependent variable repeat purchase intentions. Thus, rejecting the null hypotheses. It can be inferred that the sample returned an unexpected outcome demanding further research.

LIMITATIONS OF THE STUDY

This study used a non-random sample collected through convenience sampling. The approach was adopted because of the paucity of various resources and thus is not enough to present generalizable results. The valid responses used to administer statistical tools were 153 which is lesser than what Cochran's formulae suggests. The data collected through questionnaire is self-reported by respondents and thus posits scope of concealing information. The 5-point Likert Scale has lesser precision in comparison to a 7-point scale, which could have been a better choice to capture the nuance of the complex behaviour studied. Explanatory power, model fit indicators and any variance in repeat purchase intentions, could have been captured using appropriate statistical tools.

SCOPE FOR FUTURE RESEARCH

The future studies shall incorporate more variables latent and direct, to predict the repeat purchase intentions of the customers. All the aforementioned limitations must be taken into count before designing future research studies for better predictability power of the model conceptualized. Care should also be taken while sampling the respondents to avoid conceptual contradictions, as was evident about one IDV hygiene practices.

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Your valuable comments will help us to shape the future issues better.

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Optimum Utilisation of Resources: The Mool Mantra of Inventory Management for Modern Business to Increase Profit	☐	☐	☐	☐
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Call for Papers

"Vimarsh: An Endeavour to Share Knowledge"

(Volume 17/ Issue 1 Jan – June 2026)

Dear Professor,

It is our pleasure to inform you that we have completed the process of receiving papers for the ***Volume 16/ Issue 2 July – December 2025*** and started the process for ***Volume 17/ Issue 1 January – June 2026*** of our bi-annual, peer-reviewed refereed journal ***"Vimarsh: An Endeavour to Share Knowledge" (ISSN 0976-5174),*** erstwhile included in the ***UGC approved list of journals at no. 63419).*** For more than a decade now, ***Vimarsh*** has been creating a platform where academic researchers, management practitioners and governmental as well as non-governmental agencies can collectively share their works and experiences for the advancement of literature and practice of management. Publications in our journal include conceptual papers, empirical articles, and business cases by practitioners, consultants and students in the field of management and allied disciplines. ***Vimarsh*** welcomes original contributions in the form of research papers, articles, case studies or book reviews from both academics and industry on business and management related issues or associated areas in need of imperative attention. The papers or articles, based on theoretical or empirical research or experience, should illustrate the practical applicability and/or implications of the work described.

A prospective author is invited to submit the manuscript for publication consideration in a word document (.doc) at vimarsh@iftmuniversity.ac.in. The procedure includes sending the paper to the subject matter experts for the review process and henceforth publication of the paper based on the Experts' feedback.

You are requested to kindly go through the detailed *Guidelines* as well as submit the duly filled *Copyright Form* regarding the submission. *We do not charge any publication fees for the same.*

Last Date for Submission: April 25, 2026
Status (Acceptance/Rejection): April 30, 2026

Thanking you in anticipation of a fruitful and long-term association.

NOTES

READERS' VIEW

I am really excited to hold this new issue of Vimarsh. This journal offers well-curated, insightful articles that contribute meaningfully to its field. The research is presented clearly, with strong arguments and relevant references. Overall, it is a reliable and engaging resource for both academics and practitioners.

Dr. Sudhanshu Joshi
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This journal is an enjoyable and informative read, with articles that are easy to follow and well thought out. The topics feel relevant and timely, and the research is presented in a clear, engaging way. In my opinion, it is a solid resource that doesn't feel overly academic or dry.

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About the University

IFTM University has been a pioneer in bringing technical and professional education to the city of Moradabad.

Expanded into a huge ~51.74 acres campus and located at a distance of 12 km from Moradabad city on Lucknow-Delhi National Highway, IFTM University, is a State Private University established in 2010, by an Act (No. 24 of 2010) of State Legislature of Uttar Pradesh. The University is approved under section 2(f) of UGC Act 1956 and also the University is empowered to award degrees as specified by UGC under section 22 of UGC Act 1956.

From a humble beginning in 1996 with three courses, as Institute of Foreign Trade and Management, the University has now succeeded in establishing itself as a niche player by becoming a "Centre of Excellence" in various disciplines of professional education providing best in-class education in more than 80 number of Diploma, Undergraduate, Postgraduate and Doctoral Programmes in Engineering, Business Management, Pharmacy, Biotechnology, Microbiology, Arts, Sciences, Commerce, Hotel Management & Catering Technology, Law, Education, Journalism & Mass Communication, Agricultural Science & Engineering and Computer Science & Applications, etc.

IFTM University embarks upon a journey to be the "Trusted Partner of Choice" for Parents, Students, Teachers and Industry Champions. In this attempt, University now boasts to house 11000 + students and more than 400 faculty members till date. Thus, with a modest start, IFTM University has traversed a long path to become accredited with 'A' grade (CGPA 3.14) by National Assessment and Accreditation Council (NAAC) and is also the member of Association of Indian Universities (AIU). IFTM University has also been ranked in Band 101-125 in Pharmacy category by National Institutional Ranking Framework (NIRF) Ranking 2024. It strives to scale new heights and aspires to forge new partnerships with National and International bodies in order to make an indelible mark on the face of higher Education.

About The School of Business Management

The School of Business Management, formerly known as the Department of Management Studies was established in the year 1996 under the aegis of Institute of Foreign Trade & Management (IFTM) and had been offering the BBA, MBA & MIB programmes of Rohilkhand University, Bareilly, until the year 2000 when MBA programme came under the affiliation of the Uttar Pradesh Technical University, Lucknow. However, in 2010, it has been reorganized as School of Business Management (SBM) after IFTM was granted the University status by U.P. Government vide IFTM University Act No. 24 of 2010.

SBM has become one of the most reputed and sought-after centers of education and offers diverse courses ranging from Diploma in Hotel Management, UG courses such as BBA, B.Com, B.Com (Hons.), BHMCT, PG courses like MBA, M.Com, MHM and PhD in Management & commerce. Through its research and development outputs,the School has been a constant contributor in the field of management, commerce and hotel, travel and tourism management.It encourages active collaboration with industry as well as other academic institutions. The aim of the school is to continue to excel in its research and training programs, promoting both technical and managerial skills as well as higher ethics and values.

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