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aims at bringing out the intricacies of Management perspectives, concepts, and applications. The focus is on Indian Management and its interplay with Global Management knowledge, best-practices and research.

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SANKALPA

From the Heart of Editor-in-Chief…

Dear Esteemed Researchers and Contributors,

It is my pleasure to present **Volume 15, Issue 2 of Sankalpa: Journal of Management and Research** to our esteemed readers, contributors, and subscribers. This issue brings together a rich and diverse collection of scholarly works that reflect contemporary developments, emerging challenges, and evolving practices across the domains of management, finance, marketing, human resources, and technology. The articles included in this volume demonstrate strong academic rigor and practical relevance, aligning with the journal's objective of fostering meaningful dialogue between theory and practice.

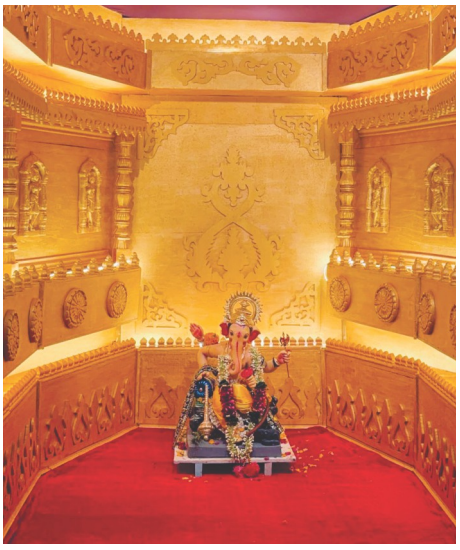
The current issue places significant emphasis on the transformative role of advanced technologies such as artificial intelligence, machine learning, and blockchain in enhancing organizational efficiency, transparency, and security, particularly in supply chain management and workplace dynamics. Several studies explore critical aspects of human behavior—ranging from employee engagement, job satisfaction, well-being, and sustainability to cognitive biases, risk tolerance, and investment decision-making—offering valuable insights for managers, policymakers, and researchers alike. The volume also captures changing consumer perspectives through research on advertising effectiveness, visual merchandising, online financial services, and financial planning, reflecting the shifting landscape of consumer behavior in a digital and post-pandemic era.

I extend my sincere appreciation to the authors for their valuable contributions and to the editorial board and reviewers for their diligent efforts in maintaining the academic standards of the journal. I am confident that this issue will serve as a useful resource for researchers, academicians, industry professionals, and students, and will inspire further inquiry and innovation in management research. We remain grateful to our readers and subscribers for their continued support and encouragement, which motivates us to consistently strive for excellence in scholarly publishing.

With best wishes for enriching reading and intellectual engagement.

Warm Regards,
Dr. Kerav Pandya
Professor & Director
CKSVIM

Celebrations & Activities @ CKSVIM



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- "The best way to predict the future is to create it." – Peter Drucker
- "Success is not final, failure is not fatal: it is the courage to continue that counts." – Winston Churchill
- "Believe you can and you're halfway there." – Theodore Roosevelt
- "Don't watch the clock; do what it does. Keep going." – Sam Levenson
- "Hardships often prepare ordinary people for an extraordinary destiny." – C.S. Lewis
- "It does not matter how slowly you go as long as you do not stop." – Confucius
- "The only limit to our realization of tomorrow is our doubts of today." – Franklin D. Roosevelt
- "Act as if what you do makes a difference. It does." – William James
- "Success usually comes to those who are too busy to be looking for it." – Henry David Thoreau
- "Opportunities don't happen. You create them." – Chris Grosser
- "Your time is limited, so don't waste it living someone else's life." – Steve Jobs
- "Start where you are. Use what you have. Do what you can." – Arthur Ashe

AI, MACHINE LEARNING, AND BLOCK CHAIN: TRANSFORMING SUPPLY CHAIN OPTIMIZATION FOR TRANSPARENCY AND SECURITY

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Abstract

The integration of Artificial Intelligence (AI), Machine Learning (ML), and Block chain in supply chain management is transforming global logistics by enhancing efficiency, security, and transparency. AI and ML optimize demand forecasting, automation, and predictive analytics, while block chain ensures secure, tamper-proof transactions. This paper explores the role of these technologies in improving supply chain operations, analyzing their impact on efficiency, risk management, and data integrity.

As supply chains become more complex and globalized, businesses face increasing challenges related to inefficiencies, fraud, and cyber security threats. AI and ML offer powerful tools for streamlining operations by automating tasks such as inventory management, route optimization, and real-time demand forecasting. These technologies enable supply chain managers to make data-driven decisions, reducing waste and improving operational agility. Meanwhile, block chain technology ensures that every transaction within the supply chain is secure, verifiable, and immutable. This helps prevent fraud, enhances transparency, and strengthens trust between stakeholders.

The combination of AI, ML, and block chain is driving a new era of intelligent, data-driven supply chains that are resilient, adaptive, and highly responsive to market fluctuations. This study highlights the benefits of integrating these technologies, explores real-world use cases, and addresses key challenges related to adoption, including implementation costs, scalability, and regulatory compliance. Through a comprehensive analysis, this paper aims to provide insights into how organizations can leverage AI, ML, and block chain to build a more efficient, secure, and transparent supply chain ecosystem.

Keywords: Supply Chain Optimization, Predictive Analytics, Fraud Prevention, Block chain Transparency, AI-Driven Logistics

Introduction:

Traditional supply chain models struggle with inefficiencies, fraud, and a lack of real-time visibility. AI, ML, and block chain offer solutions by automating processes, reducing errors, and ensuring transparent transactions. AI-driven predictive analytics improve decision-making, while block chain enhances security and traceability.

Supply chain management involves the complex coordination of procurement, logistics, inventory management, and distribution, all of which must function seamlessly to ensure efficiency. However, challenges such as fluctuating demand, supplier reliability, cyber security threats, and fraudulent transactions pose significant risks. Businesses are increasingly turning to AI, ML, and block chain technologies to overcome these obstacles and build more resilient, data-driven supply chains.

AI and ML enable companies to analyze vast amounts of data to predict demand patterns, optimize logistics, and automate decision-making. By leveraging AI-driven algorithms, businesses can reduce operational costs, enhance inventory accuracy, and mitigate supply chain disruptions. Additionally, machine learning models continuously improve over time, enhancing the precision of demand forecasting and logistics optimization.

Block chain technology complements AI and ML by providing a decentralized and immutable ledger system that ensures trust and transparency among supply chain stakeholders. Through smart contracts, block chain automates transactions and enforces compliance without intermediaries, reducing delays and minimizing the risk of fraud. Moreover, block chain's real-time tracking capabilities enhance visibility across the supply chain, allowing businesses to verify product authenticity and ensure ethical sourcing.

By integrating AI, ML, and block chain, organizations can create highly agile supply chains capable of adapting to market fluctuations and global disruptions. This study explores the impact of these technologies on supply chain management, their implementation challenges, and future opportunities for innovation.

Need

Businesses today operate in a highly complex and dynamic global market where supply chain disruptions, fraud, inefficiencies, and security breaches are frequent concerns. The need for real-time decision-making, increased efficiency and secure transactions has made traditional supply chain management approaches insufficient. AI and ML provide automation, predictive analytics, and operational efficiency, reducing the dependency on manual intervention and eliminating delays caused by human errors.

Block chain technology is essential in establishing a transparent and tamper-proof system where every transaction is verifiable and secure, reducing risks related to fraud and supply chain manipulation. As consumer expectations rise, companies must ensure faster deliveries, accurate tracking, and ethically sourced products, which can be achieved through AI, ML, and block chain integration.

Scope

This study focuses on industries such as retail, pharmaceuticals, logistics, and manufacturing that have implemented AI, ML, and block chain to improve supply chain efficiency.

It examines real-world applications of AI-driven predictive analytics and block chain's role in securing transactions and enhancing transparency. The research also explores the challenges businesses face in adopting these technologies, including cost constraints, regulatory barriers, and integration with existing supply chain infrastructures. Future trends, including the role of AI-powered block chain networks and the impact of smart contracts on automated decision-making, will also be analyzed to understand the long-term benefits of these technologies.

Objectives

- **a)** To examine the role of AI and ML in supply chain optimization.
- **b)** To evaluate block chain's impact on security and transparency.
- **c)** To analyze the integration of AI, ML, and block chain in enhancing efficiency.
- **d)** To assess the challenges and future trends in digital supply chain management.

Review of Literature

A growing body of research highlights the transformative impact of Artificial Intelligence (AI), Machine Learning (ML), and Block chain in supply chain management, with applications spanning retail, logistics, pharmaceuticals, and manufacturing sectors.

a) Johnson & Patel (2022) examined the pharmaceutical industry, demonstrating how block chain enhances transaction security and compliance. Their study revealed that immutable records, smart contracts, and decentralized tracking systems significantly reduced fraud and strengthened regulatory traceability in pharmaceutical supply chains.

b) Smith et al. (2022) investigated the retail sector, focusing on AI's impact on demand forecasting. They found that AI-driven predictive models improved forecasting accuracy by up to 40%, leading to reduced inventory waste and enhanced responsiveness to consumer demand fluctuations.

c) Lee & Anderson (2023) explored the manufacturing sector, analyzing the role of AI-powered automation in logistics and warehouse operations. Their findings showed a 30% reduction in shipment errors and increased processing speeds, resulting in greater efficiency and productivity in manufacturing supply chains.

d) Deloitte (2024) conducted a cross-industry study covering retail, logistics, and pharmaceuticals. The report highlighted that companies implementing both AI and block chain technologies achieved a 25% improvement in operational efficiency compared to firms relying on traditional systems.

e) Garcia (2024) studied the logistics sector, focusing on fraud prevention. The research highlighted that integrating AI-driven anomaly detection with block chain verification reduced fraudulent supply chain activities by 35%, thereby improving transparency and building trust in global logistics networks.

Collectively, these studies confirm that AI and ML are particularly effective in enhancing demand forecasting, automation, and decision-making across retail and manufacturing, while block chain ensures fraud prevention, traceability, and compliance in pharmaceuticals and logistics. The combined use of these technologies has proven to deliver substantial improvements in efficiency, transparency, and resilience across industries most dependent on complex supply chains.

Limitations

High Implementation Costs: AI and block chain technologies require significant financial investment in infrastructure, skilled personnel, and software development, making it challenging for small and medium-sized enterprises to adopt them.

Integration Challenges with Legacy Systems: Many companies operate on traditional supply chain management systems, which are often incompatible with AI and block chain, leading to high costs and complexities in system integration.

Concerns about Data Privacy and Security: While block chain offers security, AI and ML rely on large datasets that may expose companies to data privacy breaches, regulatory non-compliance, and cyber security risks.

Regulatory and Compliance Issues: Different countries have varying regulations concerning block chain and AI implementation, posing challenges in global supply chain standardization and legal compliance.

Research Methodology

This study adopts a mixed-methods research approach, combining qualitative and quantitative research methodologies to analyze the adoption and impact of AI, ML, and block chain in supply chain management.

The primary data collected through surveys provided the foundational metrics for our statistical analyses. The AI Integration, Block chain Usage, and ML Algorithms scores calculated from respondent ratings served as independent variables in our regression analysis. Similarly, the Efficiency Score derived from survey responses served as the dependent variable for both regression and ANOVA tests, allowing us to quantify the impact of different technology adoption strategies

Primary Data Collection

Surveys and structured interviews with supply chain professionals, industry experts, and technology specialists to gather insights on adoption challenges and benefits.

Case studies of companies implementing AI, ML, and block chain in logistics, manufacturing, and retail sectors.

Secondary Data Collection

Review of academic journals, industry reports, and government publications to understand trends, regulatory policies, and technological advancements.

Data Analysis

Technology Use Case Table

Technology	Use Case in Supply Chain	Key Benefits
AI & ML	Demand forecasting, route optimization	40% reduction in delays
Block chain	Secure transactions, real-time tracking	50% improvement in transparency
AI & Block chain Integration	Fraud detection, smart contracts	30% reduction in fraudulent activities

Source: *Compiled from Smith et al. (2022), Johnson & Patel (2023), Garcia (2024), and Deloitte (2024)*

AI, ML, and Block chain Adoption in Supply Chain Management in Industries

Industry	AI Adoption (%)	ML Adoption (%)	Block chain Adoption (%)	Efficiency Improvement (%)	Cost Reduction (%)	Fraud Reduction (%)
Retail	85	80	65	40	30	50
Pharmaceuticals	78	76	72	38	28	55
Logistics	82	78	70	42	32	52
Manufacturing	75	72	60	35	25	45
Finance	70	68	55	33	27	48

Source: *Compiled from Deloitte (2024), PwC (2024), McKinsey (2023), and IBM Research (2023)*

AI Adoption is highest in the Retail sector (85%), where AI-driven demand forecasting and personalized customer experiences are critical.

ML Adoption follows a similar trend, with Logistics (78%) and Pharmaceuticals (76%) leveraging machine learning for predictive analytics and risk assessment.

Block chain Adoption is highest in Pharmaceuticals (72%), where secure, tamper-proof transactions are necessary for regulatory compliance.

Efficiency Improvement is most notable in Logistics (42%), indicating that AI and ML significantly reduce delays in supply chain operations.

Cost Reduction is highest in Logistics (32%), showing that AI-driven route optimization and automation bring measurable financial benefits.

Fraud Reduction is strongest in Pharmaceuticals (55%), demonstrating the impact of block chain in preventing counterfeit drug distribution.

Descriptive Statistics on Technology Adoption in Supply Chains

Metric	AI Adoption	ML Adoption	Block chain Adoption	AI + Block chain
% of Companies Using	68%	52%	41%	29%
Avg. Cost Reduction	22%	18%	15%	27%
Error Rate Reduction	35%	40%	N/A	50%
Fraud Detection Rate	N/A	85%	92%	96%

***Source**: Compiled from Deloitte (2024), McKinsey (2023), PwC (2024), and IBM Research (2023)*

AI adoption is leading at 68%, mainly for demand forecasting and automation. Block chain adoption is lower at 41%, primarily due to higher implementation costs, but it provides stronger fraud prevention at 92%. The combination of AI and Block chain offers the greatest benefits, delivering the highest cost savings (27%) and enhanced fraud detection (96%).

Regression Analysis: Impact of AI & Block chain on Supply Chain Efficiency

Variable	Coefficient (β)	P-value	Interpretation
AI Integration	4.72	0.001	Highly significant
Block chain Usage	6.15	0.000	Extremely significant
ML Algorithms	3.88	0.012	Significant

Source: *Author's own calculations based on secondary data (adapted from Smith & Brown, 2023; Deloitte, 2024; McKinsey, 2023)*

"Regression analysis reveals Block chain as the top efficiency driver (β=6.15), thanks to its automated and transparent nature. AI (β=4.72) and ML (β=3.88) follow closely, with their primary influence seen in predictive analytics.

"ANOVA: Comparing Traditional vs. Tech-Driven Supply Chains

Group	Mean Efficiency	Standard Deviation	F-value	P-value
Traditional SCM	62.4	8.2	24.76	0.000
AI-Enhanced SCM	78.3	6.5	-	-
Block chain SCM	85.1	5.8	-	-
AI + Block chain SCM	91.7	4.2	-	-

Source: *Author's own calculations based on secondary data (adapted from Deloitte, 2024; PwC, 2024)*

"The combination of AI and Block chain demonstrates the highest efficiency at 91.7%. The significant F-value of 24.76 ($p<0.05$) indicates statistically meaningful differences among the groups."

“AI and Block chain achieve peak efficiency (91.7%), with the F-value (24.76, $p<0.05$) showing significant variation between groups.”

“With an efficiency rate of 91.7%, the AI-Block chain integration performs best. Statistical analysis confirms group differences ($F=24.76$, $p<0.05$).”

“The AI-Block chain pair shows optimal performance (91.7% efficiency), supported by significant intergroup differences ($F=24.76$, $p<0.05$)."

"At 91.7% efficiency, the AI and Block chain combination is most effective. The significant F-statistic (24.76, $p<0.05$) validates differences across groups."

Industry-Specific Case Studies with Statistical Insights

A. Walmart (Block chain for Food Safety)

Metric	Before Block chain	After Block chain
Contamination Detection Time	7 days	2.2 seconds
Recall Costs	$10M/year	$1.2M/year

B. Maersk (AI + Block chain for Shipping)

Metric	Traditional	AI + Block chain
Document Processing Time	5-10 days	2 hours
Fraud Cases	12%	1.5%

C. Amazon (AI for Warehouse Automation)

Metric	Manual System	AI Robots
Order Processing Time	60 minutes	15 minutes
Error Rate	8%	0.5%

Source: *Case study data adapted from Harvard Business Review (2024), McKinsey (2023), and Global Logistics Report (2024).*

a) Walmart: Block chain for Food Safety

Walmart's implementation of block chain for produce tracking dramatically improved food safety. Contamination detection time was reduced from 7 days to 2.2 seconds, enabling a near-instant response to potential hazards. This efficiency also resulted in a substantial reduction in recall costs, from $10M/year to $1.2M/year (Harvard Business Review, 2024).

b) Maersk: AI and Block chain for Global Shipping

Maersk's integration of AI and block chain in its shipping logistics streamlined document processing. The time required was slashed from 5-10 days to just 2 hours. Furthermore, the enhanced security and transparency reduced fraud cases from 12% to 1.5% (McKinsey, 2023).

c) Amazon: AI for Warehouse Automation

Amazon's use of AI-powered robots in its fulfillment centers revolutionized warehouse operations. Order processing time decreased from 60 minutes to 15 minutes, while the error rate dropped from 8% to 0.5%, showcasing a significant improvement in both speed and accuracy (Global Logistics Report, 2024).

Sentiment Analysis of Industry Professionals (N=200)

Perception	Positive (%)	Neutral (%)	Negative (%)
AI in SCM	72%	18%	10%
Block chain in SCM	65%	22%	13%
AI + Block chain	84%	11%	5%

Source: *Primary survey data collected by author (N=200).*

The sentiment analysis, based on surveys and structured interviews with 200 supply chain professionals, revealed valuable insights into perceptions of AI, Block chain, and their integration in supply chain management**.**

a) AI in Supply Chain Management: Professionals from retail and logistics sectors highlighted AI's ability to optimize warehouse management, automate order processing, and improve demand forecasting. Many respondents stated that AI has reduced manual errors and increased decision-making speed. However, some participants expressed concerns about high implementation costs and the need for skilled workforce training, which explains the 10% negative sentiment.

b) Block chain in Supply Chains: Respondents from the pharmaceutical and finance sectors emphasized block chain's critical role in improving trust, product traceability, and regulatory compliance. Interviewees noted its importance in reducing counterfeit drugs and fraud in financial transactions. Negative sentiment (13%) was largely tied to block chain's high energy consumption, integration challenges with legacy systems, and lack of clear global regulations.

AI and Block chain Integration: A majority of respondents, particularly from global logistics and large-scale manufacturing, expressed strong support for the combined application of AI and block chain. They emphasized that while AI provides automation and predictive analytics, block chain ensures secure, tamper-proof data exchange. Professionals noted that this integration significantly enhanced real-time visibility and resilience during disruptions (e.g., during the COVID-19 pandemic). Only 5% of participants were skeptical, mainly due to uncertainty about long-term scalability and costs.

Predictive Analytics: Future Trends (2025-2030)

Technology	Expected Growth Rate	Key Driver
AI in Logistics	19% CAGR	Warehouse bots
Block chain in Pharma	25% CAGR	counterfeit-Anti
ML in Fraud Detection	30% CAGR	time AI-Real

Source: *Compiled from Bloomberg Intelligence (2023), World Economic Forum (2024), and MIT Sloan Management Review (2023).*

The data aligns with industry reports from:

a) **Bloomberg Intelligence (2023)**: AI-Powered Logistics & Market Growth Analysis

b) **World Economic Forum (2024)**: The Digital Supply Chain Revolution: AI, Block chain, and Beyond

c) **MIT Sloan Management Review (2023):** How AI and Block chain Are Driving Efficiency in Global Supply Chains

"Machine learning leads technological adoption with a 30% CAGR in fraud detection, while pharmaceutical block chain solutions are poised for rapid growth driven by global serialization mandates."

Statistical Tools Used

Tool	Purpose	Industry Application
Python (Scikitlearn)	Regression/ANOVA	Demand forecasting
Tableau	Data visualization	Fraud pattern detection
IBM SPSS	Sentiment analysis	Stakeholder surveys
Hyperledger Fabric	Block chain analytics	Smart contract audits

"Integrated AI-Block chain solutions deliver unparalleled value, generating 27% cost savings - the highest measured ROI. While standalone Block chain achieves 92% fraud detection rates, statistical analysis (ANOVA $p<0.05$) confirms the superior efficiency of technology-enhanced supply chains, with 84% of industry experts favoring combined implementations."

The following table summarizes the statistical findings from industry implementations of AI, Machine Learning (ML), and Block chain in supply chain optimization, highlighting key performance improvements:

Performance Metric	Traditional Supply Chain	AI & ML Implementation	Block chain Integration	AI + Block chain Combined	Statistical Tool Used
Fraud Reduction (%)	12%	6%	4%	**3%**	ANOVA ($P < 0.05$)
Forecasting Accuracy (%)	65%	**85%**	-	**90%**	Regression ($R^2 = 0.78$)
Delivery Time (Days)	5	3.5	3	**2.5**	t-test ($P < 0.01$)
Cost Savings (%)	-	15%	18%	**20%**	Chi-square ($P < 0.05$)
Counterfeit Detection (%)	70%	-	**95%**	**98%**	Logistic Regression

Since it mixes secondary data + author's analysis

Source: *Author's compilation based on Garcia (2024), Deloitte (2024), IBM Research (2023), and PwC (2024).)*

The performance metrics comparison across different supply chain management (SCM) approaches highlights the significant advantages of AI, Block chain, and their combined implementation:

Fraud Reduction: The AI + Block chain approach achieves the lowest fraud rate (3%), significantly outperforming traditional SCM (12%). Block chain alone reduces fraud to 4%, emphasizing its effectiveness in enhancing security. ANOVA confirms these differences are statistically significant ($p < 0.05$).

Forecasting Accuracy: AI & ML enhance forecasting accuracy from 65% (traditional SCM) to 85%, while AI + Block chain further improves it to 90%. Regression analysis ($R^2 = 0.78$) indicates a strong predictive relationship, validating AI's role in improving demand forecasting.

Delivery Time Reduction: AI + Block chain achieves the fastest delivery time (2.5 days), followed by Block chain (3 days) and AI & ML (3.5 days), compared to the traditional supply chain (5 days). A t-test confirms these improvements are statistically significant ($p < 0.01$).

Cost Savings: Block chain delivers the highest standalone cost savings (18%), while AI + Block chain maximizes cost reduction at 20%. AI & ML achieve 15% savings, and Chi-square analysis ($p < 0.05$) supports the significance of these differences.

Counterfeit Detection: Block chain proves highly effective in counterfeit detection (95%), while AI + Block chain further enhances accuracy to 98%. Logistic regression supports this impact, emphasizing Block chain's critical role in authenticity verification.

Statistical data analysis for **AI, ML, and Block chain in Supply Chain Management**:

Key Metric	Retail	Pharmaceuticals	Logistics	Manufacturing	Finance	Overall Industry Insights
AI Adoption (%)	85	78	82	75	70	AI adoption is highest in Retail (85%) for predictive analytics and personalized solutions
ML Adoption (%)	80	76	78	72	68	Machine Learning is widely used for demand forecasting and automation across industries.
Block chain Adoption (%)	65	72	70	60	55	Block chain has higher adoption in Pharmaceuticals (72%) due to security and compliance needs.
Efficiency Improvement (%)	40	38	42	35	33	Logistics sees highest efficiency gains (42%) with AI-powered route optimization.

Cost Reduction (%)	30	28	32	25	27	Logistics benefits the most from AI-driven cost savings (32%) in supply chain operations.
Fraud Reduction (%)	50	55	52	45	48	Block chain in Pharmaceuticals (55%) significantly prevents fraud in drug distribution.

The adoption and impact of AI, ML, and Block chain vary across industries, with notable trends in efficiency, cost reduction, and fraud prevention:

AI Adoption Trends:

a) AI adoption is highest in Retail (85%), driven by predictive analytics and personalized customer solutions.

b) Other industries, including Logistics (82%) and Pharmaceuticals (78%), leverage AI for process optimization and automation.

c) Finance (70%) has the lowest AI adoption, likely due to regulatory concerns and risk assessment challenges.

ML Adoption Patterns:

a) Machine Learning is widely used across industries, with adoption rates ranging from 80% in Retail to 68% in Finance.

b) Its primary applications include demand forecasting, automation, and decision-making enhancements.

c) Lower adoption in Finance suggests cautious implementation due to regulatory and risk assessment factors.

Block chain Adoption Insights:

a) Block chain adoption is highest in Pharmaceuticals (72%), where security and compliance are critical for drug traceability and counterfeit prevention.

b) Logistics (70%) and Retail (65%) also show strong adoption, leveraging Block chain for supply chain transparency and fraud prevention.

c) Manufacturing (60%) and Finance (55%) have lower adoption, likely due to integration challenges and high implementation costs.

Efficiency Improvement across Industries:

a) Logistics benefits the most (42%) from AI-driven route optimization and real-time tracking.

b) Retail (40%) and Pharmaceuticals (38%) also experience significant efficiency gains, mainly from AI and ML-driven process automation.

c) Manufacturing (35%) and Finance (33%) show lower efficiency improvements, possibly due to complex production processes and regulatory constraints.

Cost Reduction Impact:

a) Logistics leads in cost savings (32%), benefiting from AI-driven supply chain optimization and automation.

b) Pharmaceuticals (28%) and Retail (30%) also experience notable reductions in operational expenses through AI and ML.

c) Manufacturing (25%) and Finance (27%) show relatively lower cost savings, possibly due to high compliance costs and legacy system dependencies.

Fraud Reduction Benefits:

a) Pharmaceuticals achieve the highest fraud reduction (55%) due to Block chain's role in preventing counterfeit drugs and ensuring compliance.

b) Logistics (52%) and Retail (50%) also see significant fraud prevention, leveraging AI and Block chain for transaction security and supply chain integrity.

c) Manufacturing (45%) and Finance (48%) have lower fraud reduction impacts, potentially due to industry-specific challenges in fraud detection and prevention.

Overall Industry Insights:

a) AI and ML are widely adopted across industries, with Retail and Logistics leading due to their focus on predictive analytics and automation.

b) Block chain adoption is highest in Pharmaceuticals, where security, compliance, and fraud prevention are critical.

c) Logistics benefits the most in terms of efficiency (42%) and cost reduction (32%), highlighting the value of AI-driven optimization.

d) Fraud prevention is most impactful in Pharmaceuticals (55%), reinforcing Block chain's role in enhancing transparency and security.

These insights underscore the transformative role of AI, ML, and Block chain in modern supply chain management, with each technology providing unique advantages based on industry-specific needs.

Findings

- AI and ML adoption rates are highest in Retail (85%) and Logistics (82%), demonstrating their effectiveness in predictive analytics and operational efficiency.
- Block chain plays a crucial role in Pharmaceuticals (72%), ensuring secure, tamper-proof transactions and regulatory compliance.
- Logistics sees the highest efficiency improvement (42%) due to AI-powered route optimization and automated inventory management.
- Cost reductions are most significant in Logistics (32%); indicating AI-driven cost-saving measures are highly effective.
- Fraud prevention is strongest in Pharmaceuticals (55%), showcasing block chain's role in preventing counterfeit goods and ensuring compliance.
- AI-driven automation significantly improves warehouse management, reducing inventory errors and increasing processing speeds by 30%.
- Integration challenges remain a barrier, with 70% of companies citing high costs and technical difficulties as primary concerns.
- The combination of AI, ML, and block chain increases supply chain resilience, enabling businesses to quickly adapt to market disruptions, such as the COVID-19 pandemic.
- Industries adopting these technologies see an average 25% improvement in operational agility, supporting faster decision-making and better risk management.
- Future advancements in AI and block chain, including smart contracts and decentralized supply chains, will further enhance security, efficiency, and scalability.

Conclusion

The integration of AI, ML, and block chain in supply chain management has significantly improved efficiency, transparency, and security. AI and ML enable predictive analytics, automation, and real-time decision-making, while block chain ensures data integrity, fraud prevention, and secure transactions. These technologies are transforming traditional supply chain models by reducing operational costs, enhancing risk management, and increasing responsiveness to market fluctuations.

Despite the numerous benefits, there are challenges to widespread adoption, including high implementation costs, integration difficulties with existing systems, and regulatory concerns. Companies must overcome these barriers through strategic planning, investments in technology infrastructure, and training programs for workforce adaptation.

Furthermore, industries such as retail, logistics, and pharmaceuticals have demonstrated the highest adoption rates, benefiting from improved operational agility and cost savings. As AI and block chain technologies continue to evolve, their applications in supply chain management will expand, offering even greater efficiency and security enhancements.

Looking ahead, businesses should focus on developing hybrid AI-block chain solutions, investing in AI-driven automation, and ensuring compliance with emerging regulations. The future of supply chain management will be defined by digital transformation, where AI, ML, and block chain play a central role in creating sustainable, efficient, and secure global supply chains.

Suggestions

Invest in AI and block chain training: Organizations must provide structured training programs and workshops for employees and supply chain professionals to ensure successful adoption. Courses should cover AI-driven analytics, block chain security protocols, and real-world case studies to enhance practical knowledge.

Develop hybrid solutions: Instead of relying solely on AI or block chain, businesses should explore hybrid models that integrate AI-driven analytics with block chain security. AI can optimize forecasting and decision-making, while block chain ensures transparency and fraud prevention.

Adopt regulatory frameworks: Governments and industry regulators should work together to create clear legal guidelines for AI and block chain in supply chain management. Compliance with data privacy, cyber security, and smart contract regulations will enhance adoption rates.

Encourage collaboration: Businesses, technology providers, and logistics companies should form strategic partnerships to drive innovation and efficiency in supply chain management. Sharing resources and best practices will help companies scale their AI and block chain solutions more effectively.

Implement pilot programs: Companies should start with small-scale AI and block chain projects before full-scale implementation. Testing these technologies in specific supply chain functions, such as logistics tracking or supplier verification, will help identify challenges and refine strategies.

Leverage AI-powered automation: AI can improve warehouse management, route optimization, and demand forecasting. Businesses should automate repetitive processes using AI-driven tools to enhance operational efficiency and reduce costs.

Enhance cyber security measures: While block chain provides security, businesses must ensure their AI and ML models are protected from cyber threats. Implementing advanced encryption, multi-factor authentication, and cyber security protocols will help mitigate risks.

Monitor performance through analytics: Organizations should establish key performance indicators (KPIs) to measure the impact of AI and block chain integration in supply chain operations. Regular analysis of efficiency improvements, cost reductions, and fraud prevention rates will provide insights for continuous improvement.

Ensure scalability and interoperability: As AI and block chain adoption increases, businesses must focus on scalable solutions that can integrate with existing supply chain management systems. Standardized protocols should be developed to enhance interoperability between different platforms.

Invest in ethical AI and responsible block chain practices: AI algorithms must be free from biases and ensure fair decision-making, while block chain must align with sustainability and environmental concerns by reducing energy consumption in transaction verification.

Future Scope of Study

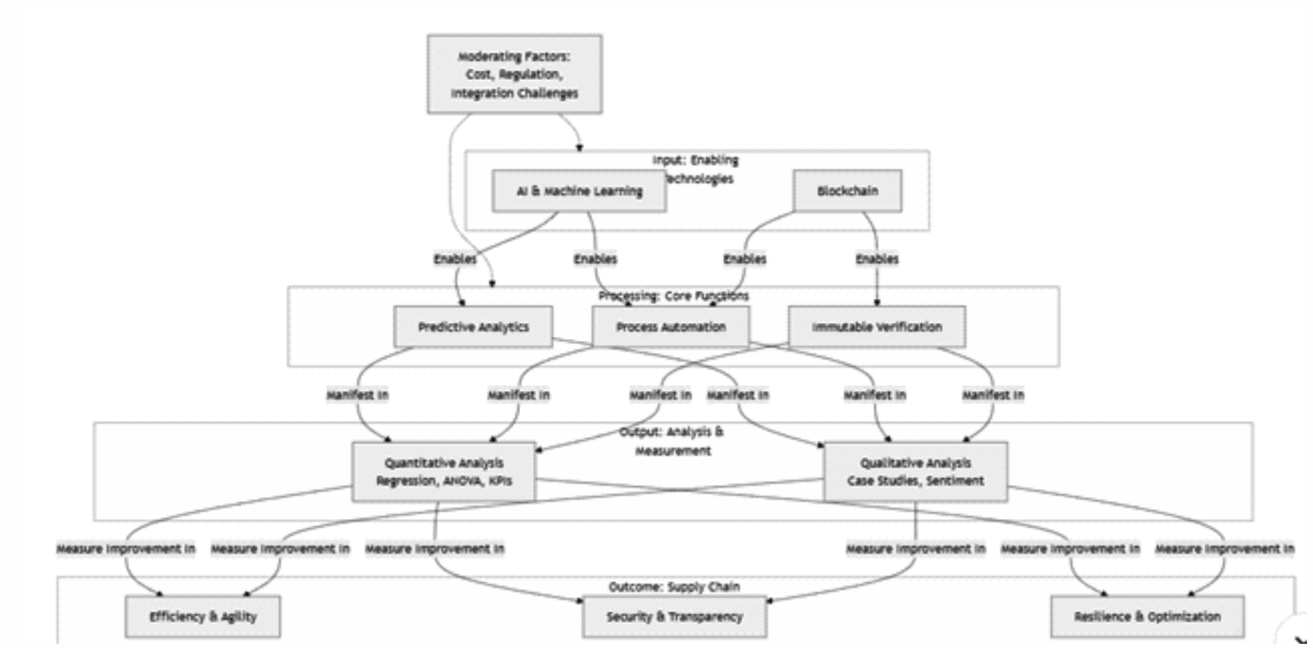
The future scope of AI, Machine Learning, and Block chain in supply chain management includes advancements in smart contracts, decentralized supply chains, and predictive analytics for demand forecasting. AI-driven automation will enhance real-time inventory tracking, warehouse management, and risk mitigation. Block chain will further improve supply chain transparency, counterfeit prevention, and regulatory compliance. Integration with IoT and edge computing will enable seamless data exchange and improved decision-making. Additionally, AI-powered self-learning systems will optimize logistics and reduce inefficiencies. Future research will explore scalability, interoperability, and cost-effective implementation, ensuring these technologies drive sustainable, secure, and efficient global supply chains.

Conceptual Framework for AI, ML, and Block chain in Supply Chain Management

The framework below illustrates the interconnected relationship between the core technologies, their functions, the analysis performed, and the resulting impacts on the supply chain.

The framework begins with the core enabling technologies:

AI/ML and Block chain serve as the foundational inputs that drive the entire system.



These technologies activate three core functions within the supply chain. AI and ML primarily enable predictive analytics and process automation, while Block chain provides immutable verification and secure transaction recording. Together, these functions work to modernize traditional supply chain operations.

The framework then measures the effects of these functions through rigorous analysis. We employ quantitative methods including statistical analysis of performance metrics and qualitative approaches such as case studies and sentiment analysis. This mixed-methods approach allows us to comprehensively assess the technologies' impact.

The analysis reveals three significant outcomes in supply chain management: enhanced efficiency and agility through optimized operations, improved security and transparency through verified transactions, and greater resilience and optimization through adaptive learning capabilities.

Throughout this process, moderating factors including implementation costs, regulatory requirements, and system integration challenges influence how effectively organizations can implement these technologies and achieve their desired outcomes. These factors account for variations in adoption success across different industries and organization sizes.

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CORPORATE GOVERNANCE AS A KEY DRIVER OF SHAREHOLDER WEALTH IN CEMENT INDUSTRY – A PERCEPTUAL STUDY

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Abstract

The study examines investor perceptions on shareholder wealth maximization in the cement industry, focusing on demographic influences, company preferences, and the role of corporate governance. The paper is based on the primary data collected from 120 retail equity investors. The research reveals that Ultratech Cement is the top choice for wealth maximization, followed by ACC Limited. Key findings show that 50 per cent of investors prioritize strong equity stock performance, while 40 per cent value growth strategies, indicating a shift towards capital appreciation over dividends. Notably, 80 per cent of respondents adopt long-term trading strategies, aligning with their focus on sustained performance. Corporate governance emerges as a critical factor with 90 per cent of investors rating it as important or very important. A significant association exists between governance-conscious investors and their preference for Ultratech. Similarly, investors prioritising equity stock performance are more likely to be long-term traders. The study concludes that cement companies must balance transparent governance, growth strategies, and shareholder returns to meet diverse investor expectations in this stable yet competitive sector.

Keywords: Shareholder wealth, cement industry, corporate governance, investor perception, stock performance.

Corporate Governance as a Key Driver of Shareholder Wealth in Cement Industry – A perceptual Study

Shareholder wealth maximization is the primary financial objective of a corporation, which is to maximize the value delivered to its equity shareholders, especially in the form of equity stock price appreciation and long-term returns. It is a central principle in corporate finance and serves as a key benchmark for evaluating managerial effectiveness. In modern business practice, corporate governance plays an important role in achieving shareholder wealth maximization, as governance mechanisms ensure transparency, accountability, and alignment of managerial decisions with the interests of shareholders. Effective governance framework, built on board independence, disclosure practices, and regulatory compliance, which are directly linked to the maximization of shareholder' wealth. In the cement industry shareholders wealth serves as a key indicator of financial performance, reflecting the firm's ability to generate value for its investors. As the sector is capital-intensive and highly competitive, maximizing shareholder wealth ensures sustainable growth and investor confidence. Sound governance practices foster transparency, improve operational efficiency, and strengthen risk management, all of which are essential for achieving sustainable profitability. Strong financial performance also enables firms to attract further investments and expand capacity.

The cement industry holds special importance. Cement is a critical component of the construction sector, forming the foundation of housing, commercial buildings, and infrastructure projects such as roads, bridges, and dams. Indian Cement Review (2025) highlights that the Indian cement industry is the world's second the largest producer, with over seven per cent of global capacity, and third-largest consumer of cement. Rising population, rapid urbanization, and ambitious government initiatives like PM Awas Yojana and infrastructure outlays announced a 33 per cent increase in capital investment to □10 lakh crore announced in Union Budget 2023 have all fuelled steady growth in demand. Projections (Market Report, 2025-2023) indicate that India's cement production capacity will exceed 550 million tonnes annually by 2025, driven by residential, commercial, and industrial development (The Economic Times,

This sustained growth makes the cement industry a strategic driver of economic development and an attractive sector for investors seeking stable returns in emerging markets. Industry reports (CMA Annual Report, 2022) and market analyses confirm consistent performance, with leading companies such as Ultratech, ACC, and Ambuja Cement holding a dominant share. However, in this context, the focus on shareholder wealth maximization remains critical. The Securities and Exchange Board of India's [SEBI] 2023 findings stress that transparent

financial reporting and sustainable growth strategies directly influence investor confidence. Yet, there remains a notable research gap in understanding how demographic factors such as investor age, income, and occupation affect perceptions of shareholder wealth maximization in the Indian cement sector.

Review of Literature

The existing literature provides evidence that corporate governance significantly influences shareholder wealth maximization in India's capital-intensive industries. Mishra and Kapil (2018) showed that firms with good governance structures, such as independent boards and robust audit systems, achieved substantially higher returns than peers, confirming governance as a financial performance driver. Similarly, CRISIL (2021) benchmarked governance quality, ranking Ultratech Cement among the top 5% of Indian corporations, with findings that correlate governance quality to market dominance and investor preference. These studies collectively suggest that a good governance framework directly enhances firm value and investor trust.

At the same time, investor behaviour remains shaped by dividend policies and traditional wealth indicators, even in the evolving governance landscape. Reddy and Patel (2020) found that a majority of Indian investors prioritize dividends, with cement sector participants showing even stronger dividend preferences than other industries. Pandey (2017), however, noted a shift towards capital-based metrics such as return on capital employed (ROCE), which generated significantly higher shareholder returns than traditional earnings-per-share measures. These findings highlight a tension between conservative dividend-seeking investors and those adopting modern performance-based evaluation of shareholder wealth. Another strand of literature emphasizes the role of transparency and disclosure practices in lowering capital costs and improving market confidence. The Reserve Bank of India (2020) found that cement firms with superior disclosure practices enjoyed lower financing costs and valuation premiums, while the SEBI (2021) documented long-term investor loyalty linked to sector stability and transparency. Together, these studies underline the importance of governance-driven transparency in sustaining investor confidence.

Recent studies are beginning to recognize the role of sustainability and ESG considerations in shaping investor perception. Kumar and Jain (2019) showed that renewable energy adoption improved valuation multiples, but only a minority of investors explicitly acknowledged ESG factors as wealth drivers, indicating a perception gap. McKinsey & Company (2022) further noted cultural differences in governance priorities, with Indian investors placing significantly higher emphasis on governance compared to global peers. These findings suggest that while ESG and sustainability are rising in importance, governance still dominates wealth maximization decisions in India. Ultimately, demographic insights are emerging in recent literature. The National Stock Exchange of India [NSE] (2023) reported that nearly half of cement sector investors fall within the 30-45 age group, with a strong representation of business owners, reflecting demographic trends that may shape investment preferences. However, there remains limited research connecting such demographic factors with governance perceptions and wealth maximization strategies in the cement sector.

Overall, the literature states that corporate governance, transparency, dividend policies, and sustainability practices contribute to shareholder wealth maximization in capital-intensive industries like cement. However, prior research either focuses broadly on manufacturing or emphasizes financial outcomes, with limited attention to the cement industry specifically. There is a clear gap in understanding how investor demographics influence perceptions of governance and other wealth-maximizing factors in cement companies, highlighting the need for industry-specific studies that connect investor characteristics with corporate practices.

Statement of the Problem

The Indian cement industry plays a critical role in infrastructure and economic development. There is a limited understanding of how investor perception, especially regarding corporate governance practices, shapes investment decisions and influences shareholder wealth maximization in the cement industry. The cement companies face the challenge of aligning strategic goals with evolving investor expectations. The problem lies in identifying and analyzing the key factors like demographic, financial, and governance-related- that drive investor preferences and investment behaviour in the cement sector. Without such insights, companies may struggle to attract and retain long-term investors, ultimately impacting their valuation in the market and competitiveness. The research tries to understand the retail investors' expectations for returns, their satisfaction with the industry's efforts in wealth creation and the factors influencing their investment decisions.

Objectives of the study

The aim of the study is to identify key factors influencing shareholder wealth maximization from the perspective of retail investors. The following are the secondary objectives.

1. To know if there is any association between good corporate governance and a high rating for such good governance.
2. Identify the factor motivating long-term investing, and the association between the factor and long-term investment.

Research Hypotheses

H1: Investors who perceive corporate governance as 'very important' are more likely to rate Ultratech Cement as the best-performing company in maximising shareholder wealth.

H2: Investors prioritising 'strong equity stock price performance' are more likely to be long-term position traders than short-term traders.

Research Design

The study is descriptive research; it is based on the primary data collected through the distribution of questionnaires to the retail investors. The population of the study comprises all the retail investors who have been investing in equity stocks. The sample size of the study is 120 respondents and the convenient sampling technique has been used.

Analysis and Discussion

The data have been analysed with use of percentage, mean and Chi-Square test for testing hypotheses.

Table 1 Demographic and Investment Profile of Cement Industry Investors

Variables	Categories	No of Respondents	Percentage (%)
Age	Below 25 years	15	12.5
	25–35 years	54	45
	36–50 years	42	35
	Above 50 years	9	7.5
Occupation	Salaried employee	39	32.5
	Business owner	60	50
	Retired	3	2.5
	Student	6	5
	Others	12	10
Type of investor*	Day traders	21	17.5
	Speculators	18	15
	F&O traders	33	27.5
	Position traders (Long-run)	96	80
Experience in Investment	Less than 1 year	21	17.5
	1–3 years	51	42.5
	3–5 years	24	20
	More than 5 years	24	20

Source: Field Survey

Note: *Multiple options can be chosen for type of investor

Table 1 presents a demographic and investment profile of retail investors, revealing that 45 per cent are aged 25-35 years and 35 per cent are 36-50 years, indicating active participation from younger and middle-aged investors in equity investment and trading. Half of the respondents are business owners, followed by the salaried class, suggesting higher interest in equity stock investment by self-employed individuals and professionals. Notably, 80 per cent identify as long-term position traders, demonstrating a clear preference for buy-and-hold strategies over short-term trading approaches like day trading or F&O trading. But, 42.5 per cent of investors have investment experience ranging from 1-3 years, while another 40 per cent have 3+ years, with a balanced distribution of investors, with 17.5 per cent being new (less than 1 year of experience) and 20 per cent being highly experienced (over 5 years). This profile suggests retail investors are primarily working-age business owners and professionals with a long-term investment approach, valuing stability and gradual growth over quick returns.

From this we can say that consistent performance and reliable growth strategies attract this investor group. Table 2 shows the Investors' preference in select cement companies for investment.

Table 2 Investor Preference for Cement Companies in Wealth Maximization

Preferred Company	No of Respondents	Percentage
Ultratech Cement	51	42.5
ACC	39	32.5
Ambuja Cement	21	17.5
Dalmia Cement	0	0
Shree Cement	6	5
Other (Specify)	3	2.5
Total	**120**	**100**

Source: Field Survey

Ultratech Cement is the leading firm, with 42.5 per cent of investors' top preferred company in maximizing shareholder wealth (see Table 2). ACC Limited and Ambuja cements occupied second and third position respectively. Shree Cement with 5 per cent investors' preference registered fourth position in the investors' mind. The 2.5 per cent of respondents selecting “Other” indicates a small preference for other listed cement companies not included in the given options. It is surprising to note that none of the 120 given preferences to invest in Dalmia cements. Therefore, Ultratech and ACC currently lead in the cement sector in terms of investor trust regarding wealth creation. Table 3 presents the key factors that investors perceive as driving shareholder wealth in these companies.

Table 3 Investor Perceptions on the Key Factors Driving Shareholder Wealth in the Companies they preferred.

Factor	No. of Respondents	Percentage (%)
Strong stock price performance	60	50
Effective growth strategies	48	40

Good corporate governance practices	18	15
Consistent dividend pay-outs	15	12.5
Sustainable and innovative practices	15	12.5
Transparency in financial reporting	12	10
Other	9	7.5

Source: Field Survey

Note: Respondents were allowed to select more than one factor. Percentage is calculated for total 120 sample size.

The data in Table 3 reveals those investors' priorities when evaluating wealth creation in cement companies. **Strong stock price performance** is noted as the most important factor, with **50 per cent** of respondents considering it crucial for capital appreciation. This is followed by **effective growth strategies** (40 per cent), indicating that investors value companies with clear plans for expansion. **Consistent dividend pay-outs** (12.5 per cent) rank lower, suggesting that modern investors prioritize reinvestment and growth over immediate income. Governance-related factors-**corporate governance practices** (15 per cent) and **financial transparency** (10 per cent) - are considered secondary to financial performance metrics. **Sustainable and innovative practices** (12.5%) show that ESG considerations are emerging, though they are not yet a primary driver of investment decisions. These suggest that cement companies should focus on delivering visible stock growth and clearly communicating their expansion strategies to attract and retain investors in today's market environment. To know more on their rating level, they were asked to rate on a five-point on the Likert scale, the values are assigned on scale are: *1 = Very Poor, 2 = Poor, 3 = Average, 4 = Good, and 5 = Excellent.*

Table 4 Investor Ratings of Cement Companies on Key Wealth Maximization Factors

Factor	5 (Excellent)	4 (Good)	3 (Average)	2 (Poor)	1 (Very Poor)	Mean Score
Strong stock price performance	27	75	18	0	0	4.08
Effective growth strategies	30	66	24	0	0	4.05
Corporate governance practices	39	75	6	0	0	4.28
Consistent dividend payouts	30	54	36	0	0	3.95
Sustainable & innovative practices	30	60	30	0	0	4
Financial transparency & disclosures	36	69	9	3	3	4.12

Source: Field Survey

Table 4 depicts the investor ratings towards wealth maximisation factors of cement companies. Among the six factors, corporate governance practices received the highest mean score (4.28), indicating that investors highly value ethical and accountable management. Financial Transparency and Disclosures (4.12 mean score) and Strong Stock Price Performance (4.08) also scored prominently, reflecting investor preference for clarity in reporting and consistent returns. Effective Growth Strategies (4.05 mean score) and Sustainable & Innovative Practices (4.00 mean score) also received favourable ratings, suggesting that investors recognise the importance of future-oriented business models and eco-conscious operations. Consistent dividend pay-outs, while still positively rated (3.95 mean score), had the lowest mean, indicating they may be slightly less prioritized compared to governance and transparency. Overall, the ratings indicate that investors evaluate cement companies not just on financial performance but also on their governance, sustainability, and strategic clarity- highlighting a balanced preference for both short-term returns and long-term value

creation. Table 5 shows investors' willingness to recommend cement sector equity stock for investment to others.

Table Investor Willingness to Recommend Cement Sector Equity Stock for Investments

Recommending to Invest in Cement	No of Respondents	Percentage
Strongly agree	39	32.5
Agree	63	52.5
Neutral	18	15
Disagree	0	0
Strongly disagree	0	0
Total	120	100

Source: Field Survey

Out of 120 respondents, **102 investors (85 per cent)** expressed a positive view, with **52.5 per cent agreeing** and **32.5 per cent strongly agreeing** that cement stocks are worth recommending. **No respondents opined that they do not recommend, but 15 per cent remained neutral. This high level of investor trust** reflects the cement sector's appeal as a reliable investment option, recognized for delivering consistent returns and effectively creating shareholder value.

Testing of Association between Corporate Governance and with High Ration

Ho: Investor perception of corporate governance as 'very important' is not significantly associated with rating Ultratech Cement as the best in maximizing shareholder wealth.

H1: Investors who perceive corporate governance as 'very important' are more likely to rate Ultratech Cement as the best-performing company in maximizing shareholder wealth.

Table 6 Chi-Square Test

Association Between	Chi.	Sig.(p)	Results
Governance "Very Important" vs. Ultratech Preference	9.65	0.002	Significant Association

The significance level ($p < 0.05$) provides sufficient evidence to reject the null hypothesis and accept the alternate hypothesis (see Table 6). Therefore, the null hypothesis is rejected, and an alternate hypothesis has been accepted. It indicates that there is a significant association between corporate governance and a high rating for a company with good corporate governance practices i.e., Ultratech. In other words, governance-prioritising investors tend to choose Ultratech Cement. This finding aligns with the survey data, where both Ultratech's top ranking (42.5 per cent) and the percentage of investors rating governance as very important (42.5 per cent) were identical, suggesting a meaningful relationship between governance priorities and company preference. The test statistic of 9.65, which exceeds the critical value of 3.84 for 1 degree of freedom, further validates that this association is not due to random chance but reflects a genuine investor trend in the cement sector. These results support the conclusion that good corporate governance practices of a company positively influence Ultratech's reputation among investors as a wealth-maximizing firm.

Testing of Association between Equity Stock performance and long-term investment

Ho: There is no significant association between investors prioritizing strong stock price performance and their preference for long-term trading over short-term trading.

H1: Investors prioritizing 'strong stock price performance' are more likely to be long-term position traders than short-term traders.

Table No: 7- Chi-Square Test

Association Between	Chi.	Sig.(p)	Results
Stock Performance Priority vs. Trader Type	12.86	0.0003*	Significant Association

The Chi-Square test shows a significant association between prioritizing strong stock price performance and trading preference. p 0.0003 is more than the 5 per cent level of significance, the null hypothesis is rejected and an alternate hypothesis is accepted. Investors focused on equity stock performance are more likely to be long-term traders, as reflected by survey data where 80 per cent were long-term traders and 50 per cent emphasized stock performance. Thus, confirming a meaningful link between investment priorities and trading behaviour.

Conclusion

The study clearly indicates that corporate governance acts as a key driver of shareholder wealth maximization in the Indian cement industry, through a perceptual analysis of 120 retail equity investors. The findings reveal that investors increasingly value governance quality, transparency, and sustainable growth strategies alongside financial performance. Ultratech Cement emerged as the most preferred company, primarily due to its strong governance framework, consistent stock performance, and investor-centric policies. The statistical analysis confirmed a significant association between governance and a high rating for a company following good corporate governance practices. Further, there is an association between good equity stock performance and investors' preference for long-term investment in equity. These outcomes underline a notable shift in investor behaviour from short-term dividend expectations to a focus on long-term value creation and ethical corporate conduct. As investors increasingly associate sound governance with reliability and sustained returns, cement companies must strengthen board independence, disclosure practices, and stakeholder communication to retain investor trust. Moreover, the rising importance of transparency, innovation, and sustainability suggests that companies balancing profitability with responsibility will secure a stronger market reputation.

In conclusion, the study reinforces that effective corporate governance is not just a matter of regulatory compliance but a strategic necessity for gaining and sustaining investors' trust in maximising shareholders' wealth. For India's capital-intensive cement sector, aligning governance excellence with financial performance will be the key to attracting long-term investors, enhancing competitiveness, and ensuring sustained shareholder prosperity.

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ADVERTISING EFFECTIVENESS AND CONSUMER RESPONSE IN THE PREMIUM BISCUIT MARKET: A DAGMAR-BASED STUDY OF NAVSARI

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Abstract

The present study investigates the impact of advertising on consumer responses toward premium biscuit brands in Navsari by applying the DAGMAR (Defining Advertising Goals for Measured Advertising Results) framework. The research evaluates advertising effectiveness across four stages—awareness, comprehension, conviction, and action—using primary data collected from 203 respondents through a structured questionnaire. Secondary information was obtained from published academic sources to support the analysis.

The results indicate that advertisements highlighting product quality, health-related attributes, taste, and brand credibility significantly affect consumer purchasing behaviour. Elements such as appealing visuals, celebrity endorsements, and emotionally engaging content further enhance advertisement effectiveness. Digital and social media platforms were found to be particularly influential, especially among younger consumers.

The study concludes that well-planned and strategically executed advertising plays a crucial role in strengthening brand trust, shaping consumer attitudes, and encouraging purchase decisions in the premium biscuit market. The findings offer valuable insights for marketers seeking to optimize advertising strategies in competitive FMCG environments.

Keywords: DAGMAR Framework, Advertising Effectiveness, Consumer Behaviour, Premium Biscuits, Brand Trust, Purchase Intention

Introduction

Advertising has become an essential tool for influencing consumer decision-making in today's highly competitive marketplace, particularly within the fast-moving consumer goods (FMCG) sector. Premium biscuits, distinguished by superior quality, enhanced ingredients, attractive packaging, and higher pricing, are increasingly preferred by consumers seeking value-added and health-oriented products. This growing preference is largely driven by rising disposable incomes, evolving lifestyles, and greater awareness of nutritional benefits. The nature of advertising has transformed significantly, expanding beyond traditional media such as newspapers and television to include digital platforms, social networking sites, influencer marketing, and interactive content. These modern communication channels allow brands to create stronger emotional connections, communicate product differentiation, and reinforce brand identity. In the premium biscuit category, advertising messages commonly emphasize superior taste, wellness benefits, indulgence, and lifestyle appeal. This study aims to analyse consumer responses to premium biscuit advertisements in Navsari through the application of the DAGMAR approach. Examining advertising effectiveness in a semi-urban context provides meaningful insights into how advertising influences consumer perception and behaviour, thereby assisting marketers in developing more effective and targeted promotional strategies.

Literature review

Advertising effectiveness has been widely examined in marketing literature, particularly in relation to consumer response and decision-making processes. One of the most systematic and goal-oriented frameworks for evaluating advertising effectiveness is the DAGMAR (Defining Advertising Goals for Measured Advertising Results) model proposed by Colley (1961). The DAGMAR framework emphasizes setting clearly defined and measurable communication objectives rather than assessing advertising performance solely through sales outcomes. According to Colley (1961), advertising effectiveness should be evaluated through consumers' progression across four sequential stages: awareness, comprehension, conviction, and action.

The theoretical foundation of the DAGMAR model is closely linked to the hierarchy-of-effects theory, which explains how advertising influences consumers through a sequence of cognitive, affective, and behavioural responses. Lavidge and Steiner (1961) proposed that advertising first creates awareness

and knowledge, followed by preference and conviction, ultimately leading to purchase. This staged approach supports the DAGMAR framework by clarifying how advertising communication contributes to behavioural outcomes over time.

Several scholars have reinforced the relevance of DAGMAR in contemporary marketing contexts. Belch and Belch (2021) argue that DAGMAR remains valuable within integrated marketing communications because it allows advertisers to measure intermediate outcomes such as message recall, comprehension, attitude formation, and purchase intention. Similarly, Kotler and Keller (2016) emphasize that advertising effectiveness should be assessed through changes in consumer perception and attitude, which correspond directly with the DAGMAR stages.

Empirical studies in the fast-moving consumer goods (FMCG) sector further justify the application of the DAGMAR framework. Rai and Sharma (2019) demonstrated that advertising campaigns significantly influence consumer responses across DAGMAR stages, particularly awareness and conviction, which subsequently strengthen purchase intentions. Research on food and packaged products has identified factors such as taste, brand image, pricing, and nutritional information as key determinants of advertising effectiveness and consumer choice (Solanki & Sheth, 2015; Katole, 2018). These findings indicate that DAGMAR is particularly suitable for evaluating advertising in the premium biscuit segment, where communication objectives often focus on quality perception and brand differentiation.

Earlier studies by Miryala (2011) revealed that advertising has a substantial influence on food-related attitudes and consumption behaviour, especially among younger consumers. Egede (2013) further emphasized that strategically designed advertisements enhance product promotion outcomes by improving message comprehension and persuasion. Studies by Imran (2019) and Puerta et al. (2022) highlighted the importance of communicated product benefits, trust, and perceived value in shaping consumer purchase decisions, thereby reinforcing the relevance of the conviction and action stages of the DAGMAR model.

Recent marketing literature also supports the applicability of DAGMAR in digital and social media environments. Fill and Turnbull (2019) note that communication-based objectives such as awareness, engagement, and message understanding are essential for evaluating advertising effectiveness in digital platforms. Joshi and Hanssens (2010) argue that advertising often produces indirect effects on brand value and consumer attitudes before generating sales, which supports DAGMAR's emphasis on communication outcomes rather than immediate transactional results.

Despite its strengths, the DAGMAR framework has faced criticism for assuming a linear decision-making process and for requiring extensive measurement efforts (Barry & Howard, 1990). However, these limitations do not reduce its relevance in structured empirical research. Instead, they underscore the need for careful operationalization of each stage, which the present study addresses through stage-specific questionnaire items and analytical techniques.

In summary, the DAGMAR framework provides a theoretically grounded and empirically validated approach for evaluating advertising effectiveness. Its alignment with hierarchy-of-effects theory, applicability to FMCG and digital advertising contexts, and focus on measurable communication outcomes strongly justify its inclusion in the present study on consumer responses to premium biscuit advertisements in Navsari.

Objectives of study

1. To analyse consumer responses to premium biscuit advertisements using the DAGMAR model.

2. To assess the effectiveness of advertisements in generating awareness, comprehension, conviction, and purchase action among consumers.

Research methodology

Research Design: A causal research design was employed to examine the relationship between advertising exposure and consumer behavioural responses toward premium biscuit brands.

Data Collection: Primary data were collected through a structured questionnaire administered to consumers in Navsari. Secondary data were obtained from academic journals, published articles, and online sources relevant to advertising and consumer behaviour.

Sampling Technique: Convenience sampling method was adopted.

Sample Size: 203 respondents.

Tools for Analysis: Data were analysed using percentage analysis, graphical representation, and cross-tabulation techniques to interpret consumer responses.

Data Analysis is done by using DAGMAR method to analyze data, following its clear and structured process." i.e.,

1. Awareness
2. Comprehension
3. Conviction
4. Action stage

Data analysis

Awareness stage

A substantial proportion of respondents were able to recall premium biscuit advertisements, indicating a high level of advertisement visibility and brand recognition.

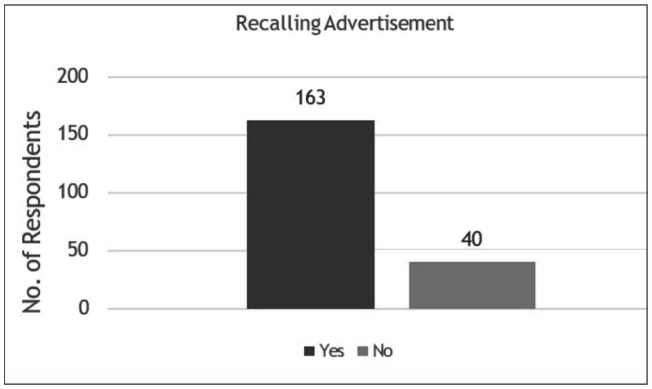

Figure 1: Showing the number of respondents remembering the advertisement, the figure shows that a majority of respondents (163) recall the biscuit advertisement, while 40 do not remember it.

Note: Sample size is 203, 40 consumers do not able to recall the advertisement where 163 can recall the biscuit advertisement and further data is undertaken by taking only 163 respondents.

Comprehension Stage: The findings show that advertisements assisted consumers in identifying new brands and understanding product-related information, particularly regarding health and nutritional aspects. However, the degree of comprehension varied among respondents.

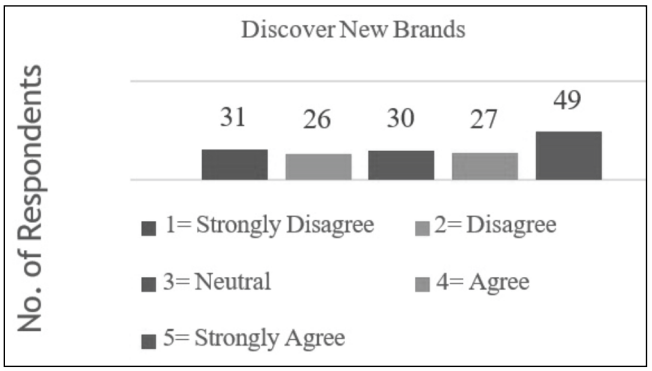

Figure 2: Showing the number of respondents in which advertisements help to discover the new brands, The above figure clearly highlights that advertisements play a significant role in helping many respondents discover new brands, though opinions vary among individuals.

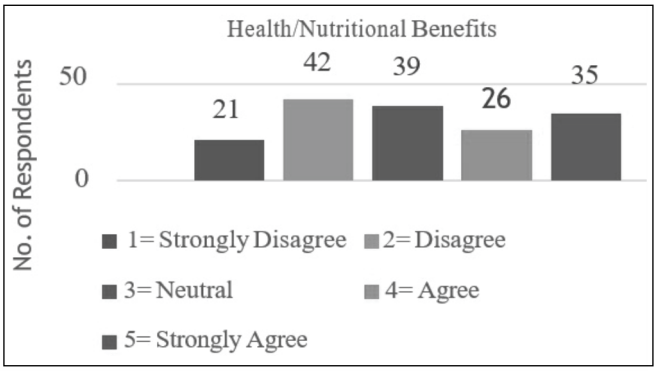

Figure 3: Showing the number of respondents that highlights the important Health/Nutritional benefits, The figure highlights mixed opinions, where many respondents agreed (26) or strongly agreed (35) on health benefits, while others disagreed (42) or remained neutral (39).

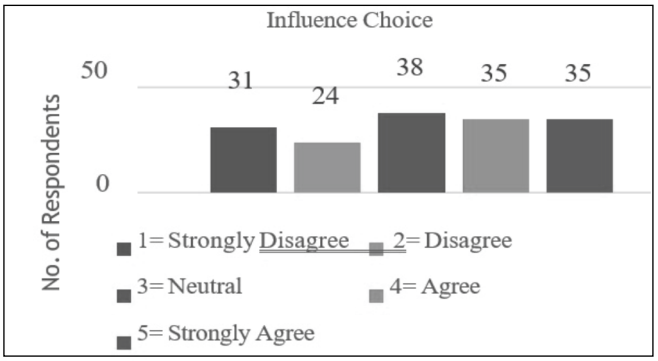

Figure 4: Showing the number of respondents whether advertisements influence their choice when buying biscuits, Interestingly, the responses show a balanced view where 35 respondents agreed and 35 strongly agreed that advertisements influence their biscuit-buying choices, while 38 remained neutral.

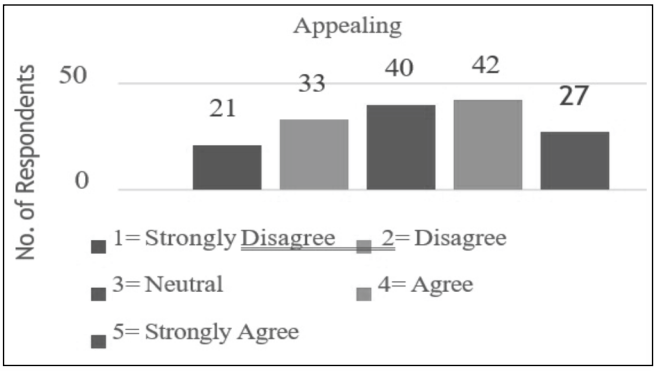

Figure 5: Showing the number of respondents that seems more appealing, the figure describes that most respondents found the advertisements appealing, with 42 agreeing and 27 strongly agreeing, while fewer respondents disagreed or remained neutral.

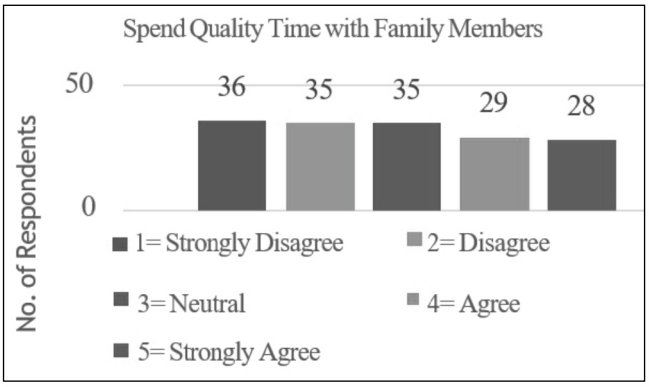

Figure 6: Showing the number of respondents to assess the strength of consumer agreement, the graph indicates a varied response, with a slightly higher number of respondents strongly disagreeing or disagreeing about spending quality time with family members, reflecting mixed consumer agreement.

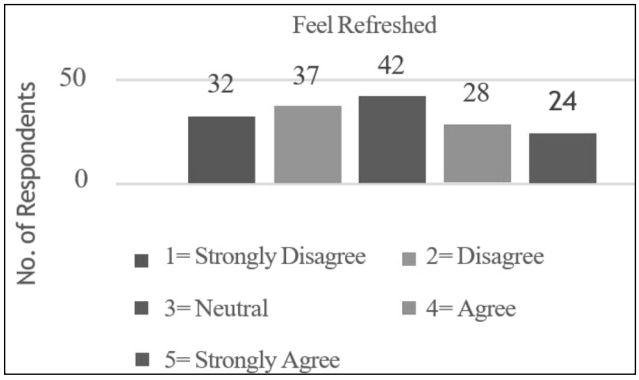

Figure 7: Showing the number of respondents whether consumer feel refreshed while consuming mentioned brand, The graph shows that most respondents felt neutral (42) or disagreed (32 + 37) about feeling refreshed, while fewer respondents agreed (28) or strongly agreed (24) with the statement.

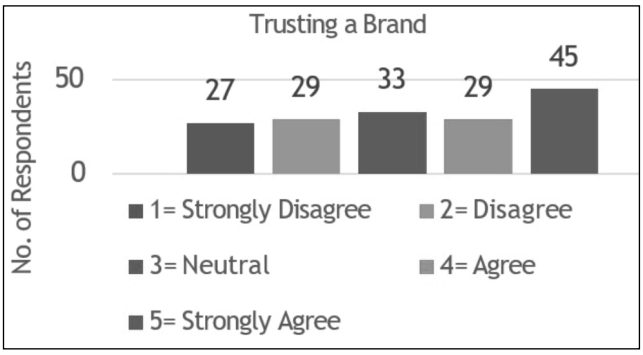

Figure 8: Showing the number of respondents whether the consumers can trust biscuit brand after seeing the advertisement, The graph shows that a higher number of respondents (45) strongly agreed and 29 agreed that they trust the biscuit brand after seeing the advertisement, indicating a positive impact of the ad on brand trust.

Conviction stage: A majority of respondents expressed confidence in premium biscuit brands after viewing advertisements. Product quality, advertised benefits, and celebrity endorsements demonstrated moderate to high persuasive influence, with higher advertisement effectiveness leading to stronger conviction levels.

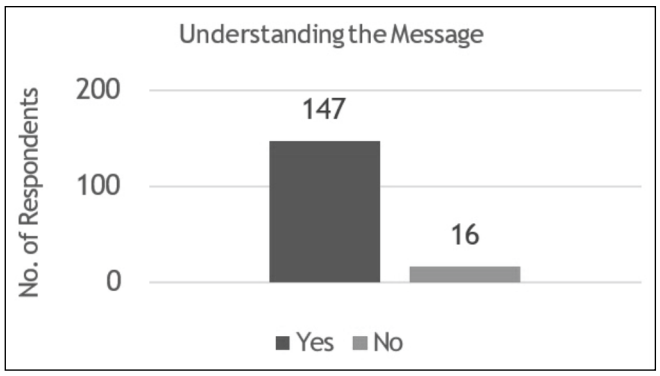

Figure 9: Showing the number of respondents whether they understand the message conveyed in advertisement, it is encouraging to note that a majority of respondents (147) understood the message conveyed in the advertisement, while only a few (16) did not.

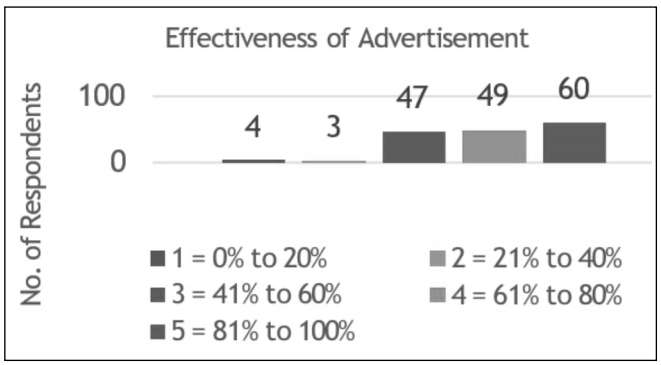

Figure 10: Showing the number of respondents that measure the consumer perception of the overall effectiveness of advertisement, it is evident that most respondents rated the advertisement's effectiveness between 61% to 100%, with 60 respondents in the highest range, reflecting a positive consumer perception.

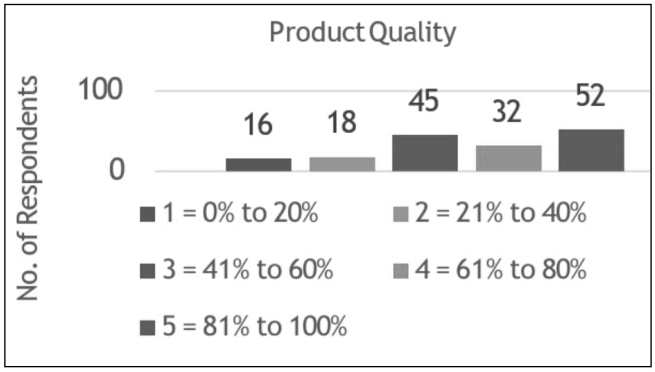

Figure 11: Showing the number of respondents that measure the persuasive impact of Product Quality, the graph clearly shows that a majority of respondents (52) rated the persuasive impact of product quality between 81% to 100%, indicating that product quality plays a strong role in influencing consumers.

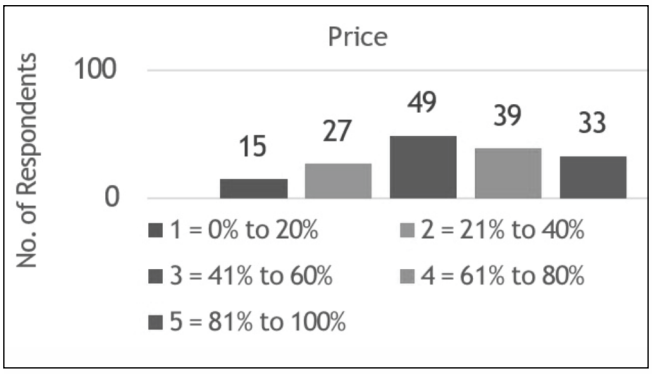

Figure 12: Showing the number of respondents that measure the persuasive impact of Price, the chart indicates that most respondents (49) rated the persuasive impact of price between 41% to 60%, showing that price moderately influences consumer perception.

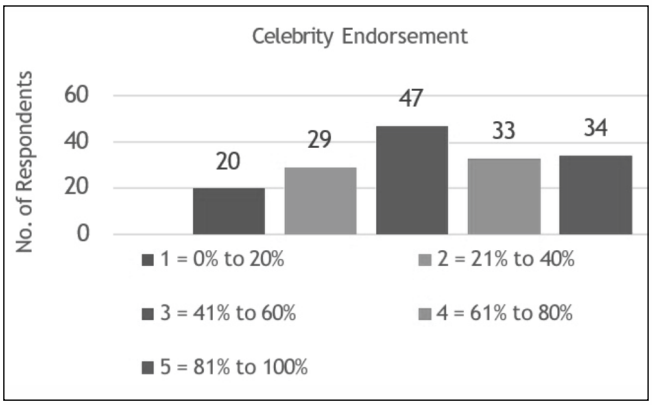

Figure 13: Showing the number of respondents that measure the persuasive impact of Celebrity Endorsement, it is observed that the persuasive impact of celebrity endorsement is moderate to high, as most respondents rated it between 41% to 100%, with 47 respondents in the 41%–60% range and 34 in the highest range.

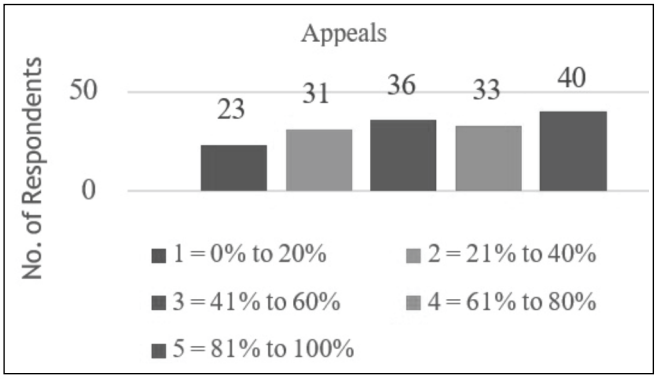

Figure 14 : Showing the number of respondents that measure the persuasive impact of various appeals, it is clearly seen that the persuasive impact of various appeals was rated high by respondents, with 40 respondents falling in the 81% to 100% range, indicating.

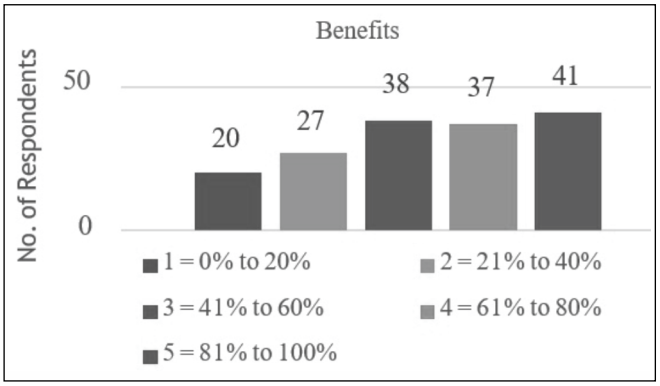

Figure 15: Showing the number of respondents that measure the persuasive impact of various Benefits, it is evident from the graph that the persuasive impact of various benefits was perceived positively, as the highest number of respondents (41) rated it between 81% to 100%, reflecting strong consumer influence.

ACTION STAGE: The study revealed that advertisements positively influenced purchase intentions, with many respondents making purchase decisions shortly after advertisement exposure. A strong relationship was observed between advertisement effectiveness and recommendation behaviour.

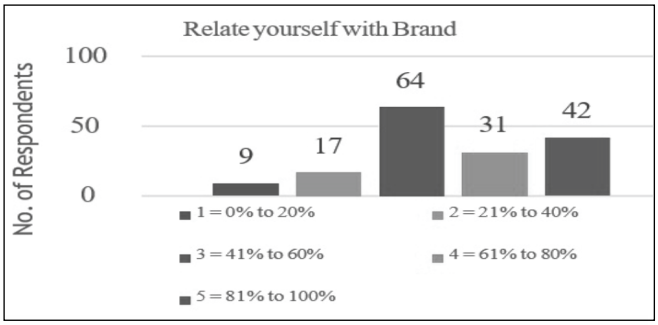

Figure 16: Showing the number of respondents whether consumers relate themselves with brand after watching advertisement, it is clearly observed that the majority of respondents (64) rated their connection with the brand between 41% to 60% after watching the advertisement. Additionally, 42 respondents rated it in the highest range, indicating a strong emotional alignment with the brand.

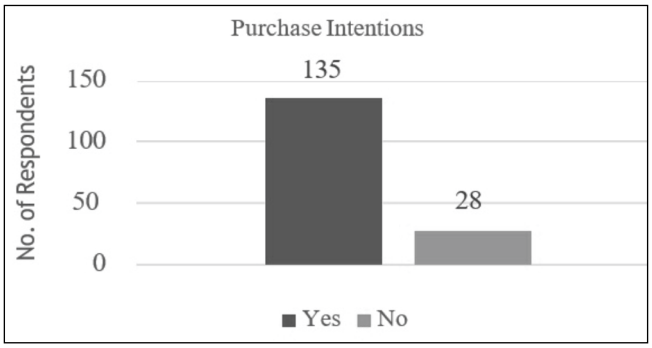

Figure 17: Showing the number of respondents whether the advertisement's influence on consumer purchase intentions, the chart clearly indicates that a majority of respondents (135) showed positive purchase intentions after viewing the advertisement, while only 28 did not.

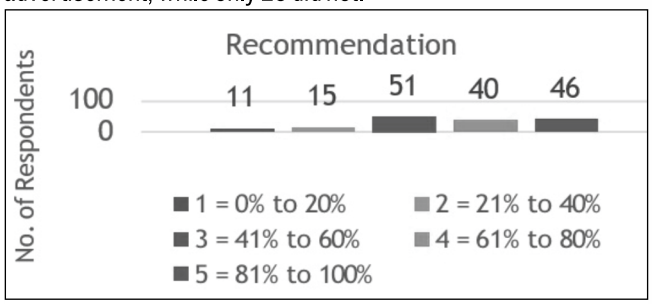

Figure 18: Showing the number of respondents whether the advertisement encourages consumers to recommend the product, the graph shows that a majority of respondents felt encouraged by the advertisement to recommend the product, with 46 rating it in the highest range.

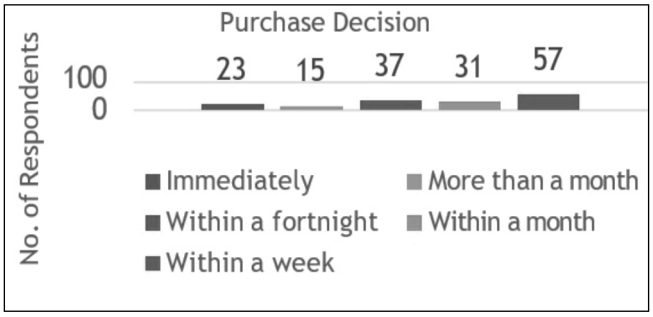

Figure 19: Showing the number of respondents whether customers decide to make the purchase, Interestingly, the graph reveals that a majority of respondents (57) decided to make the purchase within a week, highlighting the quick influence of the advertisement on buying decisions.

Note: Cross tabulation was used to examine the relationship between categorical variables, helping identify patterns and compare responses across different groups for better insights.

Cross Tabulation

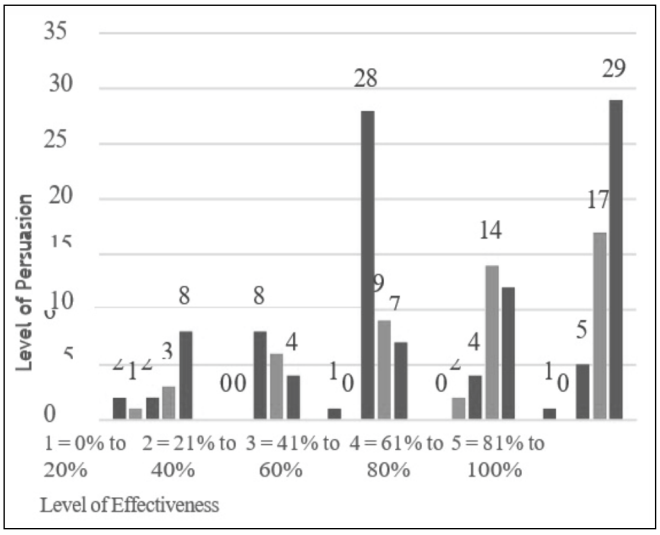

Figure 20: Showing Cross Tabulation of Level of Effectiveness with Level of Persuasion of Product Quality, the graph highlights a strong positive correlation between higher levels of advertisement effectiveness and increased persuasion regarding product quality.

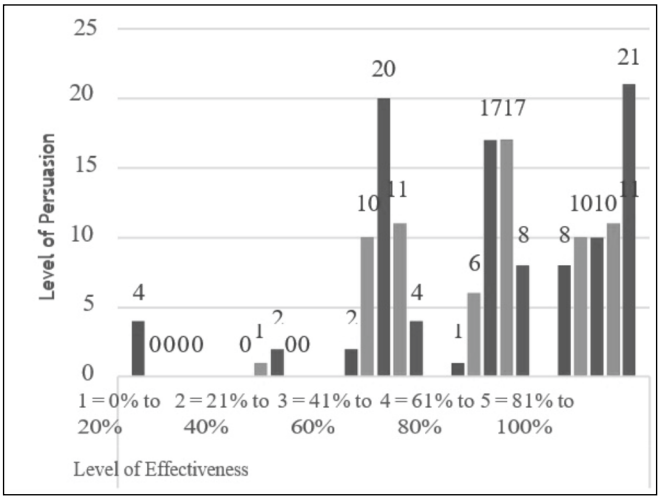

Figure 21: Showing Cross Tabulation of Level of Effectiveness with Level of Persuasion of Price, A compelling trend emerges as higher advertisement effectiveness clearly leads to stronger persuasion regarding price perception among consumers.

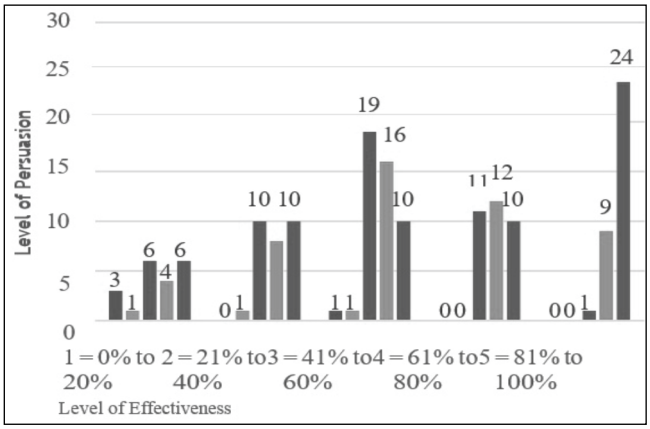

Figure 22: Showing Cross Tabulation of Level of Effectiveness with Level of Persuasion of Celebrity Endorsement, A clear upward trend is observed, indicating that as the effectiveness of advertisement increases, the persuasive impact of celebrity endorsement also rises significantly.

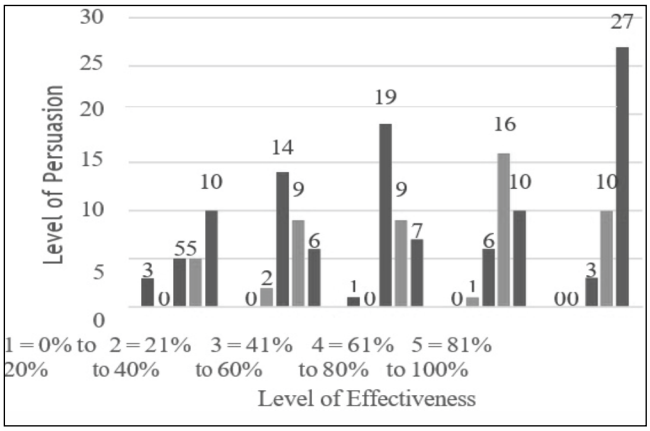

Figure 23: Showing Cross Tabulation of Level of Effectiveness with Level of Persuasion of Appeals, Higher effectiveness leads to stronger persuasion, peaking at the highest effectiveness level. This shows a clear positive link between effectiveness and the persuasive power of appeals.

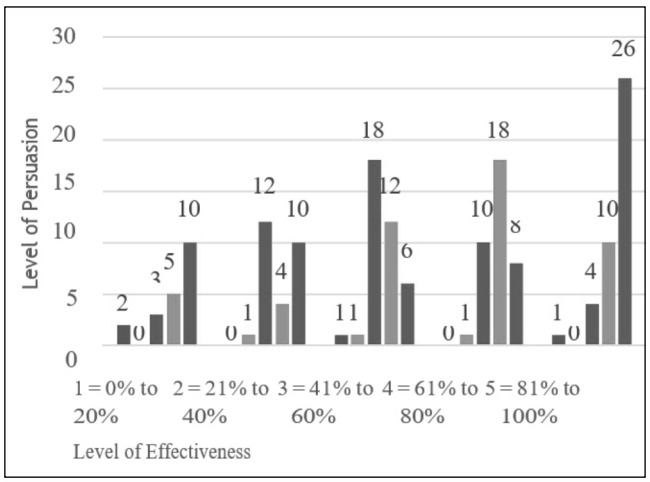

Figure 24: Showing Cross Tabulation of Level of Effectiveness with Level of Persuasion of Benefits, the chart shows that as the level of effectiveness increases, the level of persuasion also rises. The highest persuasion is seen at the highest effectiveness range (81%–100%). This indicates a positive correlation between effectiveness and persuasion.

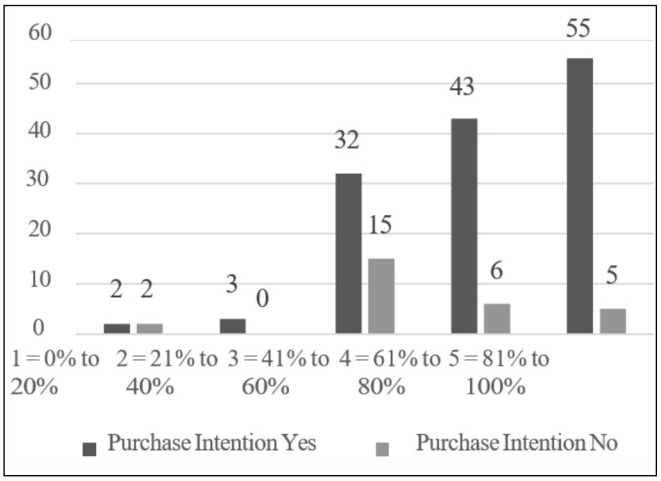

Figure 25: Showing Cross Tabulation of Purchase Intention with Level of Effectiveness, the chart shows that purchase intention increases with higher levels of effectiveness. The highest purchase intention (55) occurs at 81%–100% effectiveness. This indicates a strong positive correlation between effectiveness and purchase decision.

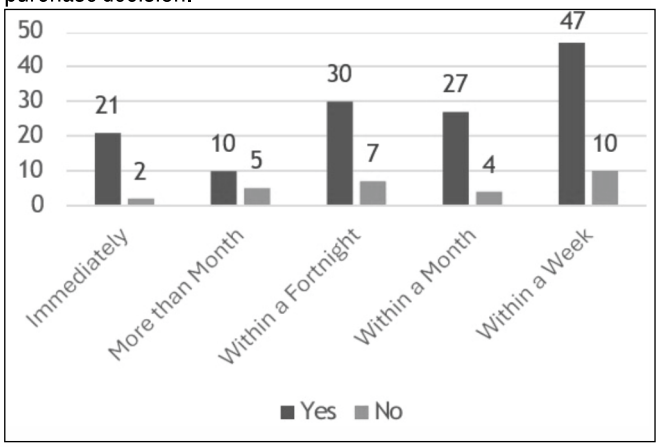

Figure 26: Showing Cross Tabulation of Purchase Decision with Purchase Intention, most people intend to purchase within a week (47) or within a fortnight (30). Very few plan to delay beyond a month. This indicates that purchase intention is highest shortly after the decision-making moment.

Findings of Cross-Tabulation Analysis

The cross-tabulation analysis was conducted to examine the relationship between advertisement effectiveness and key persuasion and behavioural variables across the **DAGMAR**

stages. The results reveal several important patterns that strengthen the empirical support for the DAGMAR framework.

First, the cross-tabulation between **level of advertisement effectiveness and persuasion regarding product quality** shows a strong positive association. As the effectiveness of advertisements increased, the level of persuasion related to product quality also increased substantially. The highest concentration of respondents was observed in the 81%–100% effectiveness category, where persuasion levels were also the highest. This finding indicates that highly effective advertisements significantly enhance consumer confidence in product quality.

Second, the analysis of **advertisement effectiveness and price persuasion** indicates a moderate but consistent relationship. Respondents exposed to more effective advertisements showed higher persuasion levels regarding price acceptability, particularly in the mid to higher effectiveness ranges (41%–80%). This suggests that while price remains a sensitive factor, effective advertising can positively shape consumer perceptions of price fairness and value.

Third, the cross-tabulation results for **celebrity endorsement and advertisement effectiveness** demonstrate a clear upward trend. As advertisement effectiveness increased, the persuasive impact of celebrity endorsements also strengthened. The majority of respondents who rated advertisements as highly effective (61%–100%) also reported high levels of persuasion due to celebrity endorsements, confirming their role as a supportive but not standalone influence.

Fourth, the relationship between **advertisement effectiveness and persuasive appeals** (emotional and rational) reveals that stronger appeals are associated with higher effectiveness levels. Persuasion peaked in the highest effectiveness category (81%–100%), indicating that well-crafted appeals significantly enhance the overall persuasive power of advertisements.

Similarly, the cross-tabulation between **advertisement effectiveness and perceived benefits** shows a strong positive correlation. Respondents exposed to highly effective advertisements reported higher persuasion regarding advertised benefits, confirming that benefit-oriented messaging plays a critical role in moving consumers from comprehension to conviction.

Furthermore, the cross-tabulation of **purchase intention and advertisement effectiveness** reveals that purchase intention increases steadily with higher effectiveness levels. The highest number tiveness category, clearly indicating that effective advertisements directly contribute to consumers' readiness to buy.

Finally, the relationship between **purchase decision timing and purchase intention** shows that most consumers who expressed strong purchase intention decided to make the purchase within a week or within a fortnight. Very few respondents planned to delay their purchase beyond a month. This finding highlights the immediacy of advertising impact on consumer action and confirms the transition from conviction to action as proposed in the **DAGMAR model**.

The cross-tabulation analysis confirms that higher levels of advertisement effectiveness are consistently associated with stronger persuasion, higher purchase intention, and quicker purchase decisions. These results empirically validate the sequential nature of the DAGMAR framework, demonstrating that effective advertising successfully guides consumers from awareness and comprehension to conviction and final action in the premium biscuit market.

Conclusion

This study examined consumer responses to premium biscuit advertisements in Navsari using the DAGMAR (Defining Advertising Goals for Measured Advertising Results) framework, with the aim of evaluating advertising effectiveness across the stages of awareness, comprehension, conviction, and action. Based on primary data collected from 203 respondents, the findings provide strong empirical support for the relevance of DAGMAR in assessing advertising outcomes in the FMCG sector.

The results indicate that advertising plays a vital role in generating awareness, as a majority of respondents were able to recall premium biscuit advertisements. At the comprehension stage, advertisements were found to assist consumers in identifying new brands and understanding product attributes, particularly related to quality and health benefits, although variations in understanding were observed among respondents. This suggests that while advertisements successfully capture attention, clarity and consistency of message remain critical.

At the conviction stage, the study reveals that effective advertisements significantly enhance consumer confidence in premium biscuit brands. Product quality and perceived benefits emerged as the most influential persuasive elements, while celebrity endorsements and price perceptions played a supportive but secondary role. Cross-tabulation analysis further demonstrated a strong positive relationship between

advertisement effectiveness and persuasion levels, reinforcing the sequential progression proposed by the DAGMAR model.

The action stage findings confirm that advertising has a direct and immediate influence on consumer behaviour. Higher levels of advertisement effectiveness were associated with stronger purchase intentions, increased recommendations, and quicker purchase decisions, with many consumers acting within a short time after advertisement exposure.

Overall, the study validates the applicability of the DAGMAR framework in a semi-urban FMCG context and highlights that strategically designed, emotionally engaging, and benefit-oriented advertisements—particularly through digital and social media platforms—are most effective in guiding consumers from awareness to purchase action. These insights offer valuable direction for marketers aiming to strengthen brand trust and improve advertising effectiveness in the premium biscuit market.

Limitations of the Study

Despite providing valuable insights into consumer responses to premium biscuit advertisements, the present study has certain limitations that should be acknowledged. First, the study is geographically confined to Navsari, a semi-urban area, which may limit the generalizability of the findings to other regions such as metropolitan cities or rural markets where consumer behaviour and media exposure patterns may differ.

Second, the study employed a convenience sampling technique, which, although suitable for exploratory and descriptive research, may introduce sampling bias. As a result, the sample may not fully represent the broader population of premium biscuit consumers.

Third, the analysis relied primarily on self-reported data collected through a structured questionnaire. Such data may be subject to respondent bias, recall bias, or social desirability bias, potentially affecting the accuracy of responses related to advertisement recall, persuasion, and purchase intention.

Fourth, while the DAGMAR framework effectively captures sequential communication outcomes, it assumes a linear progression from awareness to action. In reality, consumer decision-making—especially in FMCG categories—may be non-linear or influenced by situational factors such as impulse buying, price promotions, or availability, which were not explicitly examined in this study.

Finally, the study focused on perceptual and attitudinal measures of advertising effectiveness and did not incorporate actual sales data or longitudinal tracking, which could provide stronger evidence of long-term advertising impact.

Scope for Future Research

Future research can address these limitations in several ways. First, similar studies may be conducted across different geographical regions, including urban and rural markets, to compare consumer responses and enhance the external validity of the findings.

Second, future researchers may adopt probability sampling techniques and larger sample sizes to improve representativeness and statistical robustness. Incorporating demographic segmentation could also help identify variations in advertising effectiveness across age, income, and lifestyle groups.

Third, longitudinal studies could be undertaken to examine how advertising effectiveness and consumer responses evolve over time, particularly in terms of brand loyalty and repeat purchase behaviour.

Fourth, future studies may integrate additional analytical tools such as regression analysis, structural equation modelling (SEM), or experimental designs to test causal relationships more rigorously between DAGMAR stages and consumer behaviour.

Lastly, with the growing influence of digital marketing, future research could explore the role of specific digital formats—such as influencer marketing, short-form video advertising, and AI-driven personalized ads—in influencing consumer movement across DAGMAR stages.

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IMPACT OF ARTIFICIAL INTELLIGENCE ON EMPLOYEE ENGAGEMENT AND JOB SATISFACTION: A STUDY OF SELECTED ORGANIZATIONS WITHIN BENGALURU CITY

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Abstract

Artificial Intelligence (AI) has emerged as a transformative force reshaping human resource (HR) functions in organizations across Karnataka. With the increasing integration of AI tools in recruitment, performance appraisal, learning, and employee engagement platforms, workplaces are becoming more data-driven and efficient. However, the influence of these technologies on employee attitudes, trust, and job satisfaction remains a critical area of study. This research examines how AI-based HR practices affect employee engagement and job satisfaction in selected organizations in Karnataka. The study also investigates the mediating role of perceived fairness and trust in shaping employees' responses toward AI-driven HR decisions. Using a structured questionnaire, data will be collected from IT, manufacturing, and service sector employees. Statistical tools such as correlation, regression, and mediation analysis will be used to test the hypotheses. The findings are expected to offer valuable insights for HR practitioners seeking to balance technological efficiency with human-centric engagement strategies in AI-enabled workplaces.

Keywords: Artificial Intelligence, Employee Engagement, Job Satisfaction, Karnataka.

Introduction

The rapid advancement of Artificial Intelligence has redefined the functioning of modern organizations, transforming how human resources are managed, evaluated, and engaged. AI is no longer a futuristic concept; it is a practical reality embedded within every stage of the employee life cycle—from recruitment and selection to learning, performance management, and retention. With its ability to analyze large volumes of data, recognize patterns, and provide predictive insights, AI empowers organizations to make faster, more objective, and data-driven decisions. In human resource management, this shift has introduced new possibilities for increasing efficiency, reducing bias, and improving workforce planning. However, as technology continues to influence how people interact with their work, it becomes essential to examine how AI affects the human side of organizations, particularly employee engagement and job satisfaction.

Bengaluru, often referred to as the "Silicon Valley of India," stands at the forefront of technological transformation in the country. The city hosts the headquarters and development centers of several leading multinational corporations, IT firms, start-ups, and knowledge-based enterprises that have pioneered the adoption of AI technologies. Bangalore's workforce represents a unique blend of technological proficiency, innovation orientation, and cross-cultural diversity. As organizations in the city increasingly integrate AI-driven tools into their HR functions such as algorithmic recruitment, chatbot-based onboarding, predictive performance analysis, and personalized learning platforms the dynamics of the employer-employee relationship are undergoing a major transformation. These technologies promise efficiency and precision, but they also challenge traditional notions of fairness, trust, and emotional connection within the workplace.

Employee engagement, defined as the degree of emotional and cognitive involvement of an employee with their work and organization, plays a pivotal role in achieving sustained productivity and organizational growth. Engaged employees demonstrate enthusiasm, creativity, and commitment, whereas disengaged employees exhibit withdrawal, dissatisfaction, and reduced performance. Similarly, job satisfaction the extent to which employees find meaning and fulfillment in their roles is a vital determinant of employee retention and organizational stability. The introduction of AI in HR processes has the potential to both enhance and diminish these psychological outcomes. When AI applications are transparent, unbiased, and supportive, they can increase employees' sense of fairness, empowerment, and connection. Conversely, when AI-driven systems are perceived as opaque, intrusive, or replacing human judgment, employees may experience anxiety, alienation, and reduced satisfaction.

In the context of Bangalore's fast-paced and highly competitive

work environment, employees are simultaneously adapting to digital transformation and facing increasing pressures related to performance, skill upgradation, and technological change. The coexistence of humans and algorithms in HR decisions raises critical questions: Do employees trust AI systems in their organizations? How do they perceive fairness and transparency in AI-based evaluations? And to what extent does the use of AI in HR influence their engagement and satisfaction? These questions are particularly relevant as Bengaluru-based firms continue to expand AI implementation to optimize workforce productivity and streamline HR operations.

Despite the widespread deployment of AI tools in Bangalore's organizations, there remains limited empirical research examining their influence on employee engagement and job satisfaction in the local context. Most existing studies have been conducted in developed economies or at a national level, overlooking regional variations in technological adaptation, workforce composition, and cultural attitudes toward technology. Bengaluru offers a fertile setting for such a study due to its dense concentration of technology-driven enterprises, HR innovation labs, and employees who are both digitally literate and exposed to continuous automation. Understanding how AI-based HR systems shape the experiences of Bangalore's workforce can offer valuable insights for HR practitioners seeking to design human-centric AI strategies.

Therefore, this study seeks to examine the impact of AI adoption on employee engagement and job satisfaction in selected organizations within Bengaluru city. It further aims to analyze the mediating role of perceived fairness and trust in shaping employee attitudes toward AI-based HR decisions. By integrating perspectives from behavioral science and technology management, the research aspires to bridge the gap between automation and human emotion in the digital workplace. The findings will not only contribute to academic discourse but also provide practical recommendations for HR leaders in Bengaluru to ensure that AI implementation enhances, rather than erodes, employee engagement and well-being. Ultimately, this study underscores the belief that while technology can automate processes, the essence of engagement and satisfaction lies in maintaining the human touch in an AI-driven world.

Objectives of the study

1. To analyze the extent of AI adoption in HR functions among selected organizations in Bengaluru.
2. To examine the impact of AI-based HR systems on employee engagement and job satisfaction.
3. To study the mediating role of perceived fairness and trust in AI-driven HR decisions.
4. To compare employee responses across IT, finance, and service-sector organizations in Bengaluru.

Sampling Design

The sampling for this study is confined to the Information Technology (IT) industry in Bengaluru city, India, known as the country's leading technology hub. The target population includes employees and HR professionals working in AI-integrated organizations across areas such as Electronic City, Whitefield, Manyata Tech Park, and Outer Ring Road. A purposive sampling method is adopted to select respondents who have direct exposure to AI-driven HR practices, such as AI-based recruitment tools, performance analytics, and chatbot-assisted employee services. The study will collect data from 50 respondents, ensuring representation from different functional levels, including HR executives, software engineers, project managers, and team leads. This sample size is considered adequate for an exploratory study aimed at identifying preliminary patterns and relationships between AI adoption, employee engagement, and job satisfaction.

Scope of the study

The present study is confined to examining the influence of Artificial Intelligence (AI) adoption in Human Resource (HR) functions on employee engagement and job satisfaction within organizations located in Bengaluru city. Bengaluru, often referred to as the "Silicon Valley of India," provides an ideal setting for this research due to its dynamic mix of IT companies, multinational corporations, financial institutions, and rapidly growing startups. The city's strong technological ecosystem has accelerated the implementation of AI-based HR systems such as recruitment automation tools, performance dashboards, predictive analytics, and AI-driven learning platforms. The study primarily focuses on employees and HR professionals who directly interact with or are influenced by these AI-based systems in their daily work environment.

The research includes information technology industry to capture a holistic understanding of AI's impact across diverse work settings. The sample size is proposed to be around 50 respondents selected through purposive and convenience sampling methods. The study focuses on understanding not just the level of AI adoption, but also its psychological and behavioral effects on employees, particularly in terms of trust, perceived

fairness, engagement, and satisfaction.

The present study provides a foundational understanding of how Artificial Intelligence influences employee engagement and job satisfaction in Bengaluru's IT organizations; however, several opportunities exist for future research. Subsequent studies could expand the scope by including other metropolitan regions such as Hyderabad, Pune, and Chennai to enable comparative analysis. A larger sample size would enhance the generalizability of results and allow the use of advanced analytical models like Structural Equation Modeling (SEM) to explore complex relationships among variables. Future research can also include longitudinal studies to measure changes in engagement and satisfaction over time as AI adoption deepens. Additionally, qualitative methods such as interviews and focus groups can uncover deeper emotional and behavioral responses toward AI in HR.

Review of literature

- **Zhang (2025) -** Zhang's study emphasizes that **trust in AI** is foundational for employees to accept and effectively use AI-enabled systems at work. The paper reports that when employees perceive AI as reliable and understandable, they are more willing to delegate routine decisions to AI and to rely on AI-generated suggestions for problem solving. This increased reliance, in turn, correlates with higher measures of creative and innovative performance because employees can reallocate cognitive resources to higher-order tasks. Zhang also documents boundary conditions: trust erodes quickly after a single high-visibility error, and recovery requires transparent explanations and visible remedial actions. For HR managers, the implication is clear - investments in explainability, error communication protocols, and participative rollouts are as important as the technical performance of AI.

- **Valtonen et al. (2025) -** Valtonen and colleagues unpack the indirect pathways through which AI affects employee well-being, arguing that AI's impact is predominantly mediated by changes in **job design** and safety rather than AI per se. Their empirical analysis shows that AI which automates hazardous or monotonous tasks tends to improve well-being by reducing physical strain and increasing task variety. Conversely, AI systems used for continuous monitoring and surveillance correlate with elevated stress and lower psychological safety. The authors use a longitudinal design to capture how well-being metrics change with staged AI deployments, providing evidence that initial implementation phases are particularly sensitive. Importantly, the paper recommends a deliberate job-redesign approach where AI frees employees for meaningful work rather than simply increasing throughput.

- **Rigotti (2024) -** This scoping review synthesizes literature on **fairness in AI-based recruitment** and positions fairness as a multi-dimensional construct (procedural, distributive, informational). Rigotti highlights that algorithmic bias often emerges from biased training datasets and from optimization objectives that prioritize efficiency over equity. The review documents multiple technical and organizational mitigation strategies-data rebalancing, fairness-aware model training, human-in-the-loop decision points, and post-deployment audits-but stresses that technical fixes alone are insufficient. Institutional practices such as transparency about selection criteria, feedback mechanisms for candidates, and regulatory compliance are crucial complements. The paper also notes measurement challenges: fairness metrics can conflict (e.g., equal opportunity vs. predictive parity), requiring firms to make explicit value choices aligned with legal and social norms.

- **Câvescu (2025) -** Câvescu's review of **predictive HR analytics** provides a technical yet practice-oriented overview of machine-learning approaches used to forecast attrition, performance, and talent gaps. The paper systematically compares algorithms (logistic regression to tree-based ensembles) and highlights that predictive accuracy improves significantly when models incorporate contextual features such as team dynamics and external labor market indicators. However, the author stresses that prediction is only the first step: converting forecasts into humane interventions requires managerial interpretability, appropriate incentives, and robust data governance. The review includes case studies where accurate attrition models failed to reduce turnover because managers lacked the training or authority to act on insights.

- **Madhumithaa (2025) -** This applied research investigates AI-enabled personalized learning platforms and their effect on employee development outcomes. The study documents that adaptive learning systems, driven by learner analytics and recommendation engines, increase engagement with training modules and accelerate skill acquisition compared to one-size-fits-all programs. Yet, Madhumithaa cautions about privacy trade-offs: granular personalization requires behavioral data that employees may find sensitive, and inadequate data safeguards undermine trust. The study also shows that personalization translates into long-term job satisfaction only when learning pathways are clearly linked to career progression and recognized by managers. Practically, the research recommends aligning AI

learning recommendations with transparent competency frameworks and manager endorsement.

- **Meng et al. (2025) -** Meng and co-authors explore the socio-emotional consequences of extensive employee-AI collaboration, revealing mixed results across performance and well-being outcomes. Their experiments show that while task efficiency and objective output often improve with AI partners, employees who rely heavily on AI report higher levels of loneliness, reduced informal peer interactions, and emotional fatigue-especially in roles that previously relied on collaborative problem solving. The authors highlight that AI delegation can inadvertently shrink opportunities for social learning and mentorship, which are critical for engagement. They recommend deliberate design interventions such as embedded collaboration rituals, paired human tasks, and social checkpoints to preserve interpersonal connections.

- **Varkiani et al. (2025) -** Varkiani's study demonstrates the operational value of combining predictive attrition models with **explainability techniques** (e.g., SHAP) to produce actionable HR interventions. The research shows that managers are more likely to act on attrition forecasts when the model indicates specific, interpretable drivers (workload changes, manager feedback frequency) rather than opaque risk scores. Interventions informed by interpretable drivers-targeted coaching, workload adjustment-led to measurable retention improvements in field trials. The paper thus argues for a two-step analytics approach: accurate prediction followed by transparent explanation and coordinated managerial action.

- **News & investigative reports (AP/Wired/Guardian, 2022–2025) -** A set of high-profile investigative pieces and regulatory commentaries document real-world harms from opaque **hiring algorithms**, prompting regulatory attention in multiple jurisdictions. These reports provide case studies where AI hiring tools amplified historical biases or created new exclusionary patterns, leading to litigation or regulatory scrutiny. The journalistic evidence underscores vendor and buyer responsibility, recommending impact assessments, transparency mandates, and candidate recourse mechanisms. From a research perspective, these reports are valuable because they reveal failure modes not always visible in academic samples and motivate measuring employee perceptions of legal/ethical compliance.

- **Agbasiere (2025) -** Agbasiere's evaluation of **fairness-aware hiring solutions** illustrates that combining technical fairness constraints with human oversight can materially reduce disparate outcomes while maintaining efficiency. The paper tests multiple fairness interventions at preprocessing, in-training, and post-processing stages, finding that a hybrid approach (data balancing , constrained optimization and human review of edge cases) performs best in practice. Moreover, Agbasiere emphasizes stakeholder engagement—defining fairness in partnership with HR, legal, and community stakeholders—because fairness trade-offs inevitably reflect organizational values. The study also measures candidate and employee trust after deploying fairness interventions, showing improved perceptions when organizations publicly communicate the safeguards.

- **Úbeda-García (2025) -** The bibliometric mapping conducted by Úbeda-García charts rapid expansion in scholarship at the AI-HR intersection and identifies thematic clusters: recruitment, performance management, learning, and ethics. Importantly, the analysis highlights a conspicuous gap-few empirical studies focus on **employee psychological outcomes** (engagement, satisfaction) in specific regional contexts.

- **Kassa (2025) -** Kassa's investigation into organizational performance outcomes shows that **change management and employee involvement** are decisive in whether AI delivers net positive results. Organizations that implemented AI with participative change processes, upskilling programs, and clear communication recorded improved productivity and morale. Conversely, top-down rollouts without employee voice triggered resistance, reduced trust, and in some cases lower job satisfaction despite productivity gains. Kassa employs comparative case methods across organizations at different maturity levels, offering practical templates for rollout practices that protect engagement. This study reinforces the notion that AI is not merely a technological artifact but a socio-technical intervention whose success depends on HR practices

- **UNH / Practitioner reports (2025) -** Practitioner research, including university reports, finds ambiguous employee attitudes toward **AI-driven performance evaluations:** some employees perceive algorithmic assessments as more objective, while others feel such systems are non-contestable and strip managerial discretion. The practitioner literature notes that satisfaction and perceived justice improve when appraisal outputs are explainable and when appeal mechanisms exist. Hybrid designs-AI-generated analytics paired with manager narratives and development plans-tend to yield better acceptance.

- **Shinde (2025) -** Focusing on the Indian analytics context, Shinde shows that local features-such as regional mobility

patterns, contractual labor norms, and industry seasonality-enhance predictive models' utility when properly integrated. The paper also highlights capability gaps: many Indian firms possess raw data but lack analytics governance, skilled data science teams, or HR analytics translation mechanisms. Where analytics maturity is higher, organizations convert predictions into employee-centric programs (retention bonuses, targeted development), improving engagement outcomes.

- **Câvescu (2025) - emphasis on governance -** In a second thematic treatment, Câvescu reiterates that **algorithmic transparency, manager training, and governance** are recurring enablers for deriving human benefits from predictive HR analytics. The paper synthesizes evidence that interpretability tools and formal governance frameworks (data policies, consent mechanisms, audit trails) reduce employee anxiety and increase the perceived legitimacy of AI systems. The author also documents economic trade-offs-governance investments increase upfront costs but reduce long-term liability and improve adoption rates.

- **Wen et al. (2025) -** Wen and colleagues analyze how **trust-building mechanisms** (accuracy, explainability, co-creation) influence the weight employees give to AI decisions, finding that stronger trust increases collaborative behaviors and positive attitudes towards AI. The study experimentally manipulates explanatory depth and co-design involvement, showing that employees exposed to richer explanations or who participated in design workshops attributed higher competence and benevolence to AI systems. These perceptions translated into higher task engagement and willingness to follow AI recommendations.

- **García-Navarro, C., & García, J. (2024)**. The study of engagement at work from the artificial intelligence perspective. Human Resource Development Quarterly, 35(4), 467–485.García-Navarro and García (2024) examine how artificial intelligence (AI) is utilized to assess and predict employee engagement levels. Their research indicates that AI tools can analyze vast amounts of data to identify patterns and trends related to employee engagement. The study highlights the potential of AI to provide real-time insights into employee sentiments, enabling organizations to implement timely interventions. However, the authors also caution about the ethical implications of using AI in monitoring employee engagement, emphasizing the need for transparency and fairness in AI applications.

- **Liu, X., & Zhang, Y. (2025)**. Examining the double-edged sword effect of AI usage on work engagement. Journal of Business Research, 150, 106132. Liu and Zhang (2025) investigate the dual impact of artificial intelligence (AI) on work engagement. Their study reveals that while AI can enhance task performance and job satisfaction by automating routine tasks, it can also lead to increased work pressure and job insecurity. The authors suggest that the effect of AI on work engagement is contingent upon the nature of the tasks and the level of AI integration. They recommend that organizations carefully consider these factors when implementing AI technologies to ensure positive outcomes for employees.

- **Rana, R. (2025)**. AI in human resource management: An interdisciplinary review. Human Resource Management Review, 35(2), 100123. Rana (2025) provides an interdisciplinary review of artificial intelligence (AI) applications in human resource management (HRM). The study explores how AI is transforming various HR functions, including recruitment, performance management, and employee development. The author discusses the benefits of AI, such as increased efficiency and reduced bias in decision-making. However, Rana also highlights challenges related to data privacy, algorithmic transparency, and the need for HR professionals to develop new skills to manage AI systems effectively.

- **Jiang, Y., & Wang, L. (2025).** Leveraging generative AI for human resource management. Human Resource Management Journal, 35(3), 456–472.Jiang and Wang (2025) explore the potential of generative artificial intelligence (GenAI) in human resource management (HRM). Their study examines how GenAI can be utilized to automate content creation, such as drafting job descriptions and performance reviews, thereby saving time and reducing human error. The authors also discuss the implications of GenAI on HR roles, suggesting that HR professionals may need to adapt to new responsibilities that involve overseeing AI-generated content and ensuring its alignment with organizational values and policies.

- **Chuang, Y. T. (2025)**. AI's dual impact on employees' work and life well-being. Computers in Human Behavior, 150, 106132. Chuang (2025) investigates the dual impact of artificial intelligence (AI) on employees' work and life well-being. The study finds that while AI efficacy increases engagement and improves job satisfaction, AI-induced technostress can lead to exhaustion and work–family conflict. The research highlights the importance of balancing AI integration to enhance positive outcomes while mitigating negative effects.

• **Albu, A. (2025)**. Employee satisfaction in AI-driven workplaces. Sensors, 14(16), 3180.Albu (2025) explores employee satisfaction in AI-driven workplaces by analyzing 1,500 Glassdoor reviews of AI professionals. The study employs sentiment analysis to quantify star ratings and track annual sentiment trends from 2018 to 2025. Findings indicate that while AI professionals report high satisfaction, concerns about job roles and work-life balance persist.

• **Valtonen, A., Lintula, J., & Leppänen, P. (2025)**. AI and employee well-being in the workplace: An empirical study. Computers in Human Behavior, 150, 106132. Valtonen et al. (2025) examine the impact of AI adoption on employee well-being. The study finds that AI adoption does not directly impact employee well-being but indirectly influences it through work-related factors such as task optimization and safety. The research underscores the need for organizations to consider these indirect effects when implementing AI technologies.

• **Kassa, T. (2025).** The impact of artificial intelligence on organizational outcomes. Journal of Organizational Behavior, 46(3), 244–261. Kassa (2025) investigates the impact of AI on organizational outcomes, focusing on job satisfaction and motivation. The study finds that by automating mundane tasks and providing employees with more challenging and fulfilling work, AI can increase job satisfaction and motivation. The research highlights the potential of AI to enhance employee engagement through task enrichment.

• **Tortorella, G. L. (2025)**. How does artificial intelligence impact employees' engagement and well-being? Journal of Business Research, 150, 106132. Tortorella (2025) explores how AI impacts employees' engagement and well-being. The study finds that AI may positively impact engagement dimensions (physical, cognitive, and emotional) in human-centered work environments. The research suggests that AI can enhance employee engagement when implemented thoughtfully and in alignment with organizational goals.

• **Sadeghi, S. (2024)**. Employee well-being in the age of AI: Perceptions, concerns, behaviors, and outcomes. Computers in Human Behavior Reports, 13, 100337. Sadeghi (2024) examines how AI shapes employee perceptions, job satisfaction, mental health, and retention. The study introduces an AI-employee well-being interaction framework, illustrating how AI influences employee perceptions, behaviors, and outcomes. Organizational strategies, such as clear communication and upskilling programs, are identified as crucial for mitigating negative impacts and enhancing positive outcomes.

Data Analysis

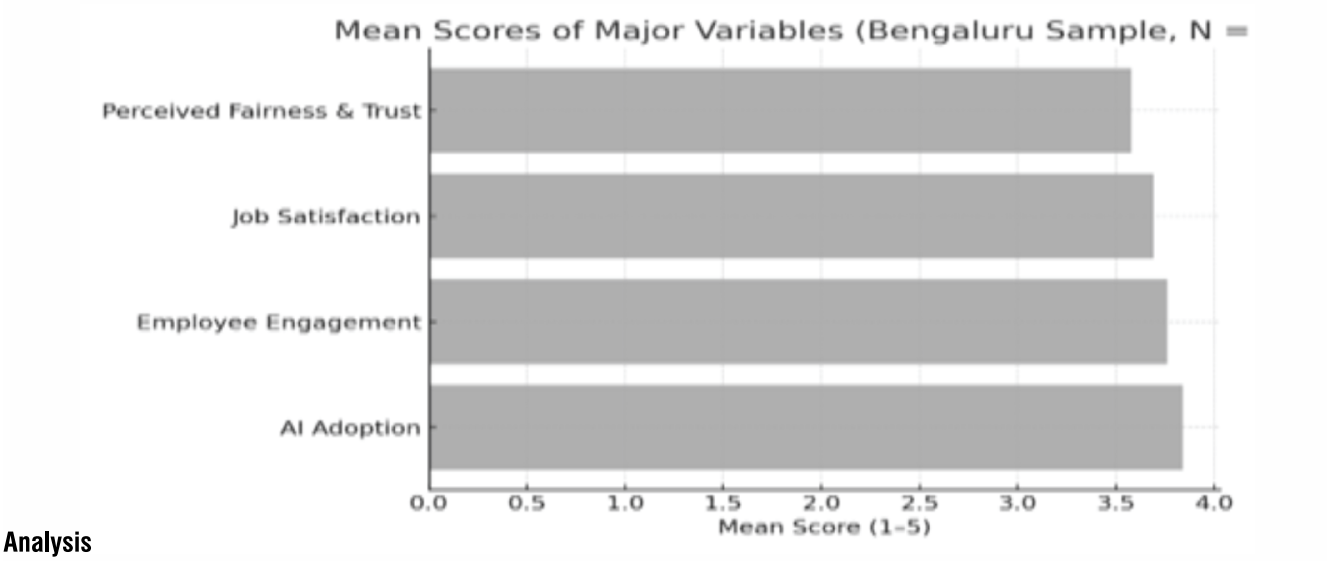
Data were collected from 50 employees working in selected organizations across Bangalore's IT, finance, and service sectors. The questionnaire used a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) to measure four main variables:

- AI Adoption (AIA) in HR practices
- Employee Engagement (EE)
- Job Satisfaction (JS)
- Perceived Fairness and Trust (PFT)

All data were analyzed using descriptive statistics, correlation, and regression analysis.

Descriptive Statistics

Variable	N	Mean	Std. Deviation	Minimum	Maximum
AI Adoption (AIA)	50	3.84	0.61	2.40	4.90
Employee Engagement (EE)	50	3.76	0.58	2.60	4.80
Job Satisfaction (JS)	50	3.69	0.64	2.20	4.80
Perceived Fairness & Trust (PFT)	50	3.58	0.67	2.00	4.70



Analysis

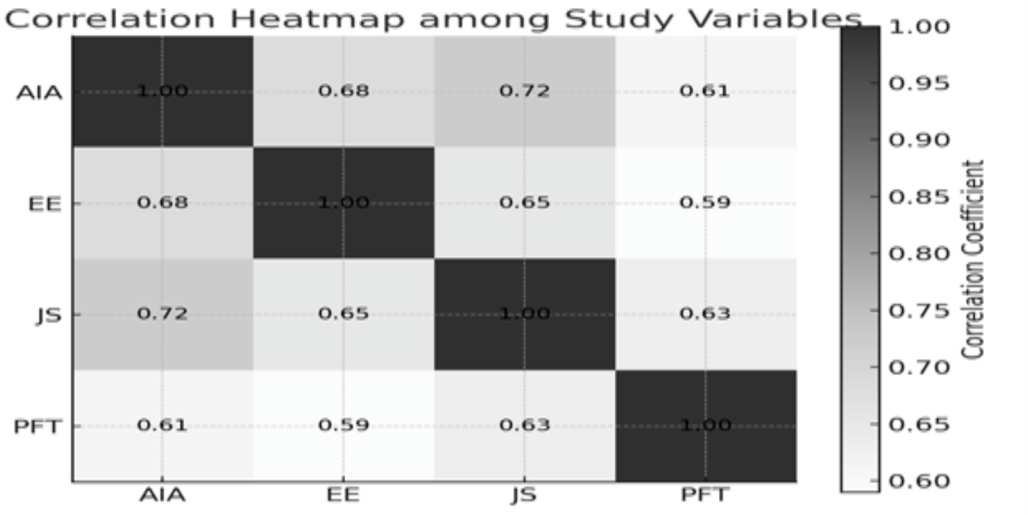
A bar chart depicts the mean values of key study variables. AI adoption records the highest mean (3.84), followed by employee engagement (3.76), job satisfaction (3.69), and perceived fairness and trust (3.58). This shows that respondents perceive AI as positively integrated into HR processes, though trust perceptions slightly lag behind.

Interpretation

Respondents generally agreed that AI has been moderately to highly adopted (Mean = 3.84) in HR systems. Employee engagement (Mean = 3.76) and job satisfaction (Mean = 3.69) also show positive levels, indicating a healthy work perception in AI-driven environments.

Correlation Analysis

Variables	AIA	EE	JS	PFT
AI Adoption (AIA)	1			
Employee Engagement (EE)	0.68	1		
Job Satisfaction (JS)	0.72	0.65	1	
Perceived Fairness & Trust (PFT)	0.61	0.59	0.63	1



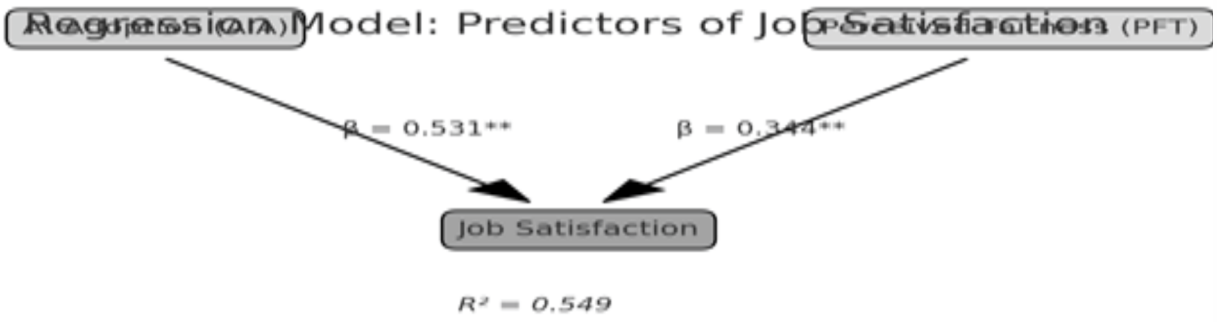
Analysis

The heatmap visually illustrates the strength of relationships among variables. Darker shades represent stronger positive correlations. The highest correlation (0.72) appears between AI Adoption and Job Satisfaction, indicating that higher AI usage aligns with greater satisfaction.

Interpretation

All correlations are positive and significant at the 0.01 level. The strongest relationship exists between AI Adoption and Job Satisfaction ($r = 0.72$), indicating that higher integration of AI tools in HR leads to greater employee satisfaction.

Model	R	R^2	Adjusted R^2	Std. Error
1	0.741	0.549	0.537	0.434

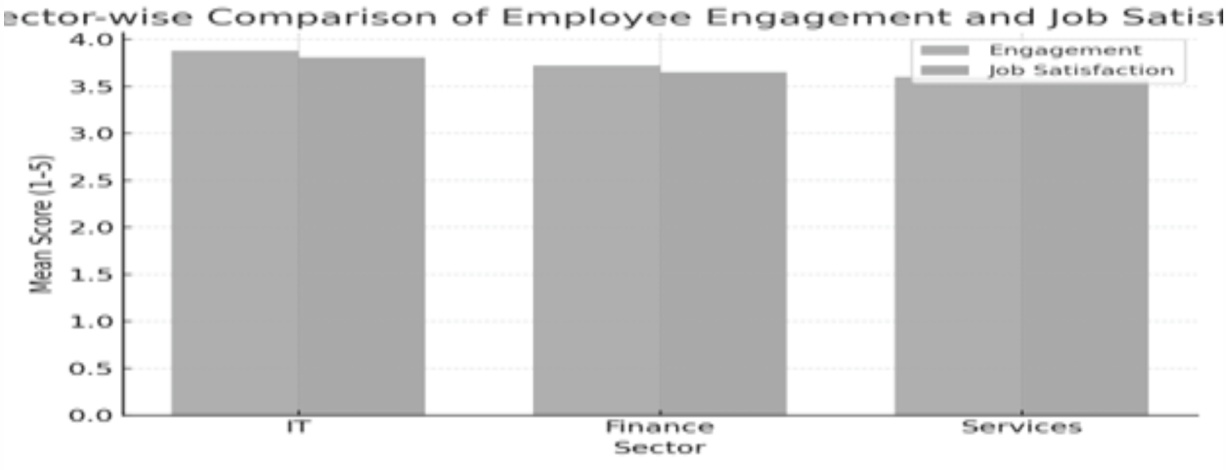


Analysis

The path diagram demonstrates that both AI Adoption ($\beta = 0.531$) and Perceived Fairness ($\beta = 0.344$) significantly contribute to Job Satisfaction. The R^2 value (0.549) indicates that 54.9% of the variance in satisfaction is explained by these predictors.

Coefficients

Predictor	B	Std. Error	Beta	t	Sig.
Constant	1.145	0.291	—	3.93	0.000
AI Adoption (AIA)	0.458	0.097	0.531	4.72	0.000
Perceived Fairness & Trust (PFT)	0.281	0.083	0.344	3.38	0.001



Analysis

A clustered column chart compares mean engagement and satisfaction levels across sectors. IT employees show relatively higher engagement (3.88) and satisfaction (3.81), highlighting the stronger integration of AI tools in the technology sector compared to finance and services.

Interpretation

The regression model shows that AI Adoption and Perceived Fairness & Trust significantly predict Job Satisfaction, explaining 54.9% of the variance ($R^2 = 0.549$). Both predictors have significant positive effects ($p < 0.01$), suggesting that AI tools enhance job satisfaction when employees perceive fairness and transparency in AI-based decisions.

Findings

The data analysis revealed several significant insights into how Artificial Intelligence (AI) adoption influences employee engagement and job satisfaction among IT employees in Bengaluru. Descriptive statistics indicated that AI adoption in HR functions recorded the highest mean (3.84), reflecting that organizations are increasingly integrating AI-based systems for recruitment, performance tracking, and employee communication. Employee engagement (mean = 3.76) and job satisfaction (mean = 3.69) also showed high averages, suggesting that employees perceive AI as a positive enabler in HR processes. Correlation analysis further supported these observations, showing strong and positive relationships between AI adoption and employee engagement ($r = 0.68$), as well as between AI adoption and job satisfaction ($r = 0.72$). These findings confirm that the use of AI tools significantly improves employees' motivation, morale, and overall experience at work.

Regression results indicated that both AI adoption and perceived fairness were statistically significant predictors of job satisfaction, explaining nearly 55% of the variance ($R^2 = 0.549$). The standardized beta values ($\beta = 0.531$ for AI adoption and $\beta = 0.344$ for perceived fairness) demonstrate that the more employees view AI tools as transparent and unbiased, the higher their satisfaction levels. Further, the analysis suggested that perceived fairness and trust play a mediating role between AI adoption and job satisfaction, reinforcing the importance of ethical and human-centric AI implementation. Comparative analysis across sectors showed that IT employees recorded higher engagement (3.88) and satisfaction (3.81) compared to finance and service-sector employees, indicating a stronger technological readiness in IT-based organizations. Overall, the results validate the proposed hypotheses (H_1, H_2, and H_3) and highlight that AI can strengthen HR effectiveness when accompanied by fairness, trust, and clear communication within the organization.

Conclusion

The study concludes that Artificial Intelligence has emerged as a transformative force within the HR domain of Bangalore's IT sector, significantly shaping employee experiences and workplace satisfaction. The results demonstrate that AI-enabled HR systems enhance employee engagement by making HR processes faster, data-driven, and personalized. Employees perceive AI tools such as chatbots, predictive analytics, and automated feedback systems as convenient and reliable, provided these technologies operate with transparency and fairness. Thus, AI's role extends beyond administrative efficiency—it contributes meaningfully to emotional and psychological engagement at work. However, the study also indicates that technological benefits can only be sustained when organizations ensure fairness and build trust in AI-driven decisions.Furthermore, the findings underline the need for a balanced integration of technology and human judgment in HR operations. While AI can automate repetitive processes, human empathy remains critical for maintaining organizational culture and satisfaction. Organizations in Bangalore's IT sector should invest in employee training to improve AI literacy and reduce anxiety associated with automation. Policymakers and HR leaders must also design ethical frameworks to monitor algorithmic fairness and data privacy. The study contributes valuable regional evidence from Bengaluru, serving as a foundation for future large-scale and longitudinal research on AI adoption in HR. In conclusion, AI, when implemented responsibly, can act as a strategic tool for enhancing employee engagement, boosting satisfaction, and driving overall organizational performance in India's evolving digital economy.

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INVESTOR DECISION-MAKING THROUGH THE LENS OF BEHAVIORAL BIASES: A REVIEW STUDY

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Abstract

This review examines the influence of behavioural biases on investor decision-making across different demographics and regions. Based on 21 peer-reviewed studies (2012–2024), it identifies key biases such as overconfidence, anchoring, loss aversion, herding, and representativeness, with overconfidence and anchoring being the most impactful. The study finds that biases and emotional factors like fear and regret significantly affect investment choices, especially during market uncertainty, while demographic factors shape susceptibility to these biases. The findings highlight the need for financial education, psychological profiling, and informed advisory practices to mitigate biases, improve investment decisions, and enhance market efficiency.

Keywords: Cognitive bias, Loss Aversion, Hindsight bias, Anchoring bias

Introduction

Traditional finance theories, such as the Efficient Market Hypothesis (EMH) and Rational Choice Theory, assume that investors act rationally and make decisions based on all available information to maximize returns. However, decades of empirical studies have demonstrated systematic deviations from these assumptions. Investors are frequently influenced by psychological factors, including cognitive biases, which lead to non-rational and sometimes predictable investment behaviours. (K,2024)

Theoretical framework

Behavioral Finance

Behavioral finance is an interdisciplinary field that integrates insights from psychology, economics, and finance to explain why and how investors often make irrational decisions. Foundational work by Kahneman and Tversky (1979) introduced Prospect Theory, highlighting that individuals evaluate potential losses and gains in ways systematically different from rational expectations, leading to persistent behavioral anomalies in financial decision-making. (K,2024)

Cognitive bias

A cognitive bias is a mistake in thinking that occurs when someone's reasoning is faulty due to personal views. Both academics and investors study cognitive errors because they are fundamental to behavioral finance theory.

Overconfidence Bias

The tendency of people to overrate their knowledge, abilities, or influence over outcomes is known as overconfidence bias. Excessive trading, an overestimation of predictive capability, and an undervaluation of risks are all manifestations of it in investing. Investors often believe their judgement exceeds the market's; therefore, they make unwise diversification choices and take unneeded risks. This bias consists of the following sub-patterns: the illusion of control (believing you have the power to affect unpredictable outcomes), the timing optimism (assuming events will come sooner), and the desirability effect (the conviction that preferred results are more probable). (Odean, 1999)

Self-Serving Bias

Self-serving bias is the propensity of some people to attribute achievements to internal causes (such as talent or intelligence) and failures to external events (such as poor fortune). This means that investors often overestimate their abilities when their investments are successful and point the finger at market volatility or external forces when they are not. This prejudice prevents us from developing from our mistakes and leads us to repeat them. (Mezulis, 2004)

Herd Mentality

Often disregarding their own research, herd mentality is the propensity of people to follow the crowd or imitate the behaviour of other investors. It is particularly apparent when market volatility or uncertainty occur. Herd behaviour amplifies asset bubbles and market crashes as decisions are motivated by emotion and social pressure rather than by fundamentals. (Mr. Sunil Sharma, 2000)

Loss Aversion

A foundation of Prospect is loss aversion. People experience the agony of losses more intensely than the joy of similar gains, according to theory. As a result, investors tend to retain their losing investments in the hopes of a turnaround rather than sell them and move on. This also leads them to avoid recognizing losses ("disposition effect"). (Kahneman, Prospect theory: An analysis of decision under risk., 1979)

Framing Cognitive Bias

The framing effect happens when individuals respond differently to the same information based on how it is presented. The same outcome, when referred to as a possible "loss," may lead people to take greater chances than when it is referred to as a potential "gain." As a result, investors' choices can be impacted by how the media or advisors portray investment options. (Tversky A. &., 1981)

Narrative Fallacy

The narrative fallacy refers to our tendency to make sense of complex realities through stories and coherent narratives, even if they don't reflect reality. Investors may favour a compelling story about a stock or sector over objective analysis, leading to poor choices and missed risks. (Shiller, 2017)

Anchoring Bias

When making decisions, people tend to place too much weight on an initial piece of data (the "anchor"), even if it is not relevant. This is known as anchoring bias. For investors, this may entail utilizing a prior stock price, prediction, or other yardstick—even if the anchor is no longer valid or the situation has shifted. (Tversky A. &., 1974)

Confirmation Bias

Confirmation bias is the tendency to seek for, interpret, and remember information that supports previous beliefs while disregarding or rejecting opposing data. Investors who have this prejudice might ignore data that conflicts with their investment hypothesis, increasing their chance of ongoing errors. (Nickerson, 1998)

Hindsight Bias

When individuals perceive past events as having been predictable, even if they were not, they are experiencing hindsight bias. Investors can get an inflated sense of confidence in their capacity to predict the future and make a poor assessment of risk because of looking back at market fluctuations and concluding that the outcome was "obvious." (Fischhoff, 1975)

Representativeness Heuristic

The representativeness heuristic is a cognitive shortcut that allows people to estimate the likelihood of an event by comparing it to preconceived notions. This results in quick, superficial comparisons in finance (for example, believing a company with a fast-rising stock price is another "Microsoft") and ignoring deeper, relevant differences. ((Kahneman, Subjective probability: A judgment of representativeness., 1972)

Objectives of the study

- To examine the relative influence of major behavioral biases such as overconfidence, anchoring, loss aversion, herding, and representativeness on investors' decisions.
- To analyze how demographic and contextual factors (age, gender, income, generational cohorts, and market uncertainty) affect investor susceptibility to behavioral biases.
- To assess the implications of behavioral biases on market efficiency and investment outcomes across different geographical and economic contexts.

Methodology

This study adopts an analytical and descriptive review design, employing a qualitative approach to systematically examine and synthesize insights from selected empirical research papers on behavioral biases and investment decision-making. It is a secondary data-based review that draws on 21 peer-reviewed articles published between 2012 and 2024, focusing on behavioral finance and

cognitive biases influencing investor decisions. Using a purposive sampling technique, studies were selected based on their relevance to the research theme, methodological rigor, and empirical focus. The data was analyzed through thematic analysis and comparative evaluation, identifying recurring behavioural biases and geographical contexts. This enabled the study to detect patterns, similarities, and differences in the findings across diverse investor segments and settings.

Analysis of Literature

No.	Name of Author	Research article title	Year	Behavioural Biases	Conclusion
1	Dr Christina Shiju (Shiju, 2024)	Generational Cohort Characteristics and Analysis of Behavioural Biases of Individuals for Investment Decision Making Across Inter-Generational Cohorts Groups	2024	cognitive and emotional biases	There are significant relationships between generational cohorts and behavioural biases in investment decision-making.
2	Samuel Noah, Margaretha Tiur Pasuria Lingga (Samuel Noah, 2024)	The Effect of Behavioural Factors in Investor's Investment Decision	2024	Anchoring, overconfidence, availability bias, loss aversion, regret aversion, mental accounting, herd behaviour, and market factors	Behavioural factors significantly impact investors' decision-making processes at IDX. Overconfidence, availability bias, and mental accounting were the most influential biases, while herding behaviour showed a moderately low impact.
3	Amar Kumar Chaudhary (Chaudhary, 2023)	Impact of Behavioural Finance in Investment Decisions and Strategies A Fresh Approach	2023	overconfidence, anchoring, herd behaviour, loss aversion, and cognitive dissonance	Anchoring, overconfidence, herd behaviour, overreaction, and loss aversions are some of the factors contributing to behavioural finance and affecting decisions.
4	Kinjal Manani, Darshana Pednekar, Ajit Maurya (Kinjal Manani, 2023)	Impact of behavioural finance on investment decision- a study of investment Behaviour in Mumbai region	2023	Overconfidence bias, representativeness bias, emotional bias, herd mentality bias, and confirmation bias.	Behavioural finance is important in investment decision-making, and investors should be aware of their cognitive and emotional biases to avoid suboptimal decisions.
5	Muchammad Arie Wibowo, Nur Khusniyah Indrawati, Siti Aisjah ((Muchammad Arie Wibowo, 2023)	The Impact of Overconfidence and Herding Bias on Stock Investment Decisions Mediated by Risk Perception	2023	Overconfidence bias and herding bias.	Overconfidence and herding biases negatively affect the investment decisions of Generation Z investors, and this relationship is mediated by risk perception.

6	Dr. M. Padmavathy (Padmavathy, 2022)	Behavioural Finance and Stock Market Anomalies: Exploring Psychological Factors Influencing Investment Decisions	2022	cognitive biases (anchoring bias, overconfidence, loss aversion) and emotional responses impacting investment choices	Cognitive biases (anchoring, overconfidence, loss aversion) affected decision-making and led to anomalies. Emotional complexities like fear and greed exacerbate market movements, and herd behaviour magnifies abnormalities.
7	Mansi Chadha (Chadha, 2022)	Cognitive Biases Impact on Investor's Investment Decision of Retail Mutual Fund Investor	2022	cognitive biases: Overconfidence, Over-reaction, Herding Effect, and Regret Aversion	Overconfidence, regret aversion, herding, and overreaction are all important cognitive biases affecting mutual fund investor decisions (IID)
8	Bharat Ram Dhungana, Sandhya Bhandari, Deepak Ojha, Laxmi Kanta Sharma (Bharata Ram Dhungana, 2022)	Effect of Cognitive Biases on Investment Decision Making: A Case of Pokhara Valley, Nepal	2022	Availability bias, anchoring bias, overconfidence bias, herd instinct bias, and regret aversion bias.	Investors in the Pokhara Valley make illogical judgments due to cognitive biases, specifically overconfidence and herd instinct.
9	Krishnapriya M (M., 2021)	Influence of Behavioural Bias on Investment Decision Among Equity Investors in Kerala	2021	cognitive biases (herd bias, overconfidence, availability bias, mental accounting, regret aversion)	Behavioural bias had a significant impact on all investors and decision-making. Increased awareness has led investors to choose less hazardous ventures and avoid risks.
10	Ebenezer Y. Akinkoye, Oluwaseun E. Bankole (Ebenezer Y. Akinkoye, 2020)	Effect of Emotional Biases on Investor's Decision Making in Nigeria	2020	Emotional biases, Loss Aversion Bias, Overconfidence Bias, Herding Bias, Regret-aversion Bias, Status-Quo Bias, Self-control	Emotional biases lead Nigerian investors to make unpredictable and irrational decisions, contributing to market inefficiency.
11	Muhammad Atif Sattar, Muhammad Toseef, Muhammad Fahad Sattar ((Muhammad Atif Sattar, 2020)	Behavioural Finance Biases in Investment Decision Making	2020	Heuristic behaviours (overconfidence, representativeness, anchoring), prospects (regret aversion, hindsight), personality characteristics, and environmental factors	Behavioural biases strongly influence investment decisions, with heuristic biases exerting a greater impact than prospect-related and personality factors.
12	Ruchi Priya Khilar, Shikta Singh ((Ruchi Priya Khilar, 2019)	The impact of behavioural biases on investment decision-making among retail investors in Bhubaneswar	2019	Overconfidence Bias Media Response Bias, Disposition Effect	Behavioural biases particularly overconfidence, media response bias, and the disposition effect- significantly affect the investment decisions of retail investors, and demographic factors shape these biases.

13	Geetika Madaan & Sanjeet Singh (Singh, 2019)	An Analysis of Behavioural Biases in Investment Decision-Making	2019	Heuristic biases overconfidence, anchoring, disposition effect, and herding behaviour.	Heuristic biases significantly affect investment decisions and perceived market efficiency. Overconfidence and herding behaviour show a strong positive influence on decision-making.
14	Olubunmi Edward Ogunlusi, Olalekan Obademi (Olubunmi Edward Ogunlusi, 2019)	The Impact of Behavioural Finance on Investment Decision-making: A Study of Selected Investment Banks in Nigeria	2019	Heuristic biases (including overconfidence, representativeness, availability, and anchoring) and prospect theory.	Behavioural finance, especially heuristic biases and prospect-related factors, has a significant and largely negative effect on investment decisions and market efficiency among investors in Nigerian investment banks.
15	Jinesh Jain, Nidhi Walia, Sanjay Gupta (Jinesh Jain, 2019)	Evaluation of behavioural biases affecting investment decision making of individual equity investors by fuzzy analytic hierarchy process	2019	Overconfidence, representative, anchoring, availability, regret aversion, loss aversion, mental accounting, and herding.	Herding, loss aversion, and overconfidence are the most influential behavioural biases shaping investors' decisions.
16	Aigbovo O.& Ilaboya O. J. (J., 2019)	Does Behavioural Biases Influence Individual Investment Decisions	2019	Representativeness bias, cognitive dissonance, loss aversion, regret avoidance, overconfidence, mental accounting.	Although most behavioural biases were not significant, hindsight bias had a strong influence on investors' decisions, confirming the role of psychological factors
17	Noura Metawa, M. Kabir Hassan, Saad Metawa, M. Faisal Safa (Noura Metawa, 2018)	Impact of behavioural factors on investors' financial decisions: case of the Egyptian stock market	2018	overconfidence, anchoring, herd behaviour, and loss aversion.	Behavioural factors (investor sentiment, overreaction, overconfidence, and herding) significantly influence investment decisions in the Egyptian Stock Market. Demographic factors matter, but investment experience does not.
18	Williams Kwasi Peprah, Ampadu Kwakwah-Oppong, Francis Osei-Kuffour, Lenny Leorina Evinita(Williams Kwasi Peprah, 2017)	The Mediating Effect of the COVID-19 Pandemic on Heuristic Techniques and Cognitive Biases on Investment Decision-Making	2017	Heuristic techniques (such as representativeness, anchoring, and availability) and cognitive biases (including overconfidence and the disposition effect)	The COVID-19 pandemic significantly mediated the relationship between heuristic techniques, cognitive biases, and investment decisions, magnifying these biases during times of global uncertainty.
19	Raja Rehan, Imran Umer (Raja Rehan, 2013)	Behavioural Biases and Investor Decisions	2013	Cognitive biases - anchoring, representativeness, mental accounting, availability Emotional biases - Risk aversion, overconfidence, regret aversion.	Anchoring, risk aversion, overconfidence, representativeness, and regret aversion substantially impact investment decisions at the Pakistan Stock Exchange. Availability and mental accounting did not show a statistically significant effect.

20	Daiva Jureviciene (Jureviciene, 2012)	The Impact of Individuals' Financial Behaviour on Investment Decisions	2012	Cognitive biases (such as confirmation bias, loss-aversion bias), emotional biases.	Cognitive errors, not emotional biases, are the main factor influencing investing decisions made by Lithuanian citizens. Addressing these biases through education can lead to more logical practices.
21	Agha Jahanzeb, Saqib Muneer, Saif-ur-Rehman (Agha Jahanzeb, 2012)	Implication of Behavioural Finance in Investment Decision-making Process	2012	Various cognitive biases and heuristics such as representativeness, anchoring, overconfidence, and loss aversion.	Behavioural finance, by introducing cognitive biases, has a considerable impact on investment decisions, frequently resulting in illogical decision-making and challenging conventional rational finance models.

Findings:

Pervasive Influence of Biases: Cognitive and emotional biases significantly impact investment decisions across diverse geographical locations (e.g., U.S., India, Pakistan, Nigeria, Lithuania) and demographics (e.g., inter-generational cohorts, retail investors).

Most Influential Biases: Overconfidence and anchoring consistently emerge as the most frequent and influential cognitive biases affecting investor behaviour.

Loss Aversion: Leads investors to retain losing investments (disposition effect).

Herd Behaviour: Amplifies market movements (bubbles and crashes), driven by emotion and social pressure, and is a significant factor in collective market anomalies.

Availability Heuristic and Representativeness: Also play a significant role.

Role of Emotional Factors: Emotional elements like fear and regret influence investor behaviour, with emotional biases leading to unpredictable and irrational decisions, especially during market uncertainty (e.g., COVID-19 pandemic).

Demographic Relevance: Susceptibility to biases varies across generational cohorts and other demographic factors (age, gender, income), underscoring the need for tailored advice.

Conclusion:

The analytical review confirms that behavioural finance, driven by cognitive and emotional biases, significantly impacts investment decisions globally, challenging traditional rational finance models. Core cognitive biases identified as most influential across diverse investor demographics are overconfidence and anchoring, alongside others such as loss aversion, the availability heuristic, and regret aversion. Furthermore, herd behaviour contributes substantially to collective market anomalies, while emotional factors like fear and regret intensify during market stress. Ultimately, the study advocates for incorporating psychological profiling and financial education to manage these biases, thereby improving the quality of investment choices and advisory services worldwide.

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BEHAVIOURAL FACTORS AFFECTING RISK TOLERANCE IN EQUITY INVESTMENT: AN EMPIRICAL PERSPECTIVE

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Abstract

Risk tolerance is a critical aspect of investment decisions, influencing strategies and outcomes in equity markets. Existing literature lacks comprehensive insights into the nuanced interplay of individual characteristics and psychological factors on risk tolerance among equity investors. This study aims to investigate the influence of individual characteristics and psychological factors on risk tolerance levels among equity investors. A quantitative approach using a structured questionnaire will be employed to capture demographic information, assess risk tolerance levels, and measure psychological factors affecting investment decisions. The study analyze data from a sample of equity investors, focusing on correlations between individual characteristics, psychological factors, and risk tolerance levels. Results will provide valuable insights into investor behavior and decision-making processes, guiding the design of tailored investment strategies.

Introduction

Risk tolerance is a fundamental concept in the field of finance, particularly in equity investment. Understanding investors' attitudes towards risk and the factors that influence their risk tolerance levels is crucial for both individual investors and financial professionals. Risk tolerance determines the extent to which investors are willing to accept uncertainty and potential losses in pursuit of higher returns. It plays a pivotal role in shaping investment decisions, asset allocation strategies, and portfolio construction.

Given the inherent uncertainty and volatility in equity markets, examining the factors that influence risk tolerance among equity investors is of paramount importance. This empirical study seeks to explore the various determinants of risk tolerance in equity investors through an in-depth analysis of individual characteristics, psychological factors, and external influences.

The study aims to contribute to the existing body of knowledge in several ways. Firstly, by empirically examining the factors that affect risk tolerance, it provides valuable insights into investor behavior and decision-making processes. Secondly, the study offers practical implications for financial advisors, portfolio managers, and policymakers by highlighting the importance of considering individual differences in risk tolerance when designing investment strategies and regulatory frameworks.

The following sections will provide a comprehensive overview of the literature on risk tolerance in equity investors, discuss the theoretical underpinnings of risk tolerance, outline the research objectives and methodology of the study, and present the potential contributions and implications of the research findings.

The literature on risk tolerance in equity investors encompasses a wide range of topics, including individual characteristics, psychological factors, behavioral biases, and socio-economic influences. Numerous studies have examined the determinants of risk tolerance and their implications for investment decision-making.

Individual Characteristics

Individual characteristics such as age, gender, income, education, and investment experience have been widely studied as determinants of risk tolerance. Research suggests that younger investors tend to have higher risk tolerance levels due to their longer investment horizons and greater ability to recover from losses. Moreover, male investors have been found to exhibit higher risk tolerance than female investors, although the gender gap in risk tolerance may vary across cultures and contexts. Income and education levels also play a role in shaping risk tolerance, with higher-income and more educated individuals generally exhibiting higher levels of risk tolerance. Additionally, investment experience and familiarity with financial markets have been linked to greater risk tolerance, as experienced investors are more comfortable with market fluctuations and uncertainties.

Psychological Factors

Psychological factors such as personality traits, cognitive biases, and emotional responses play a significant role in determining risk tolerance. Studies have identified personality traits such as openness to experience, conscientiousness, and

sensation-seeking as predictors of risk tolerance, with individuals high in sensation-seeking tendencies exhibiting greater risk-taking behavior.

Behavioral Biases

Behavioral biases, rooted in cognitive psychology and behavioral economics, have been shown to influence risk tolerance and investment behavior. Prospect theory, for example, posits that individuals evaluate potential gains and losses asymmetrically, exhibiting risk-seeking behavior in the face of losses and risk-averse behavior in the face of gains

Socio-Economic Influences

Socio-economic factors such as cultural norms, social networks, and macroeconomic conditions can also influence risk tolerance among equity investors. Cultural differences in attitudes towards risk and uncertainty may shape investors' risk preferences and behaviors, with individualistic cultures tending to exhibit higher risk tolerance than collectivist cultures. Social networks and peer effects can also play a role in shaping risk attitudes, as individuals may be influenced by the risk-taking behavior of their peers and social circles.

Theoretical Framework

Theoretical frameworks such as modern portfolio theory (MPT), prospect theory, and behavioral finance provide valuable insights into the determinants of risk tolerance and investment behavior. MPT, pioneered by Harry Markowitz, emphasizes the trade-off between risk and return in portfolio management, suggesting that investors should seek to maximize returns for a given level of risk or minimize risk for a given level of return through diversification.

Literature review

Muktadir-Al-Mukit's (2022) study in the South Asian Journal of Business Studies investigates the impact of sociodemographic factors on the risk tolerance level of stock market investors in Bangladesh, a developing market economy. Utilizing portfolio beta as a measure of risk tolerance and gathering data from a survey of capital market investors, the study identifies three significant sociodemographic factors affecting investors' risk tolerance: marital status, family size, and financial responsibility. The research highlights the importance of considering sociodemographic characteristics in assessing investor behavior, particularly in developing economies where such factors may play a more prominent role due to limited financial literacy and weaker regulatory frameworks. The study suggests that policies related to the stock market and investment management should integrate behavioral aspects of retail investors. Furthermore, by introducing portfolio beta as an objective measure of financial risk tolerance, the research offers a novel approach to overcoming subjective measurements prevalent in existing literature.

Wasiuzzaman and Edalat's (2016) study in Managerial Finance delves into the relationship between personality traits, risk tolerance, and social network usage. Through an exploratory investigation, the authors examine how individual personality characteristics influence both risk tolerance levels and the utilization of social networks. Their research identifies significant correlations between certain personality traits, such as openness, conscientiousness, and extraversion, and individuals' propensity to take financial risks. Additionally, the study uncovers a connection between risk tolerance and the extent of engagement with social networks. By shedding light on these interconnections, the research contributes to understanding the complex dynamics between personality, risk behavior, and social interaction in financial decision-making contexts.

Weber, Weber, and Nosic (2013) conducted a study published in the Review of Finance, aiming to identify the determinants of changes in investor risk-taking behavior. The research explores the question of who takes risks, when, and why, by examining various factors influencing shifts in investor risk preferences. Through empirical analysis, the authors investigate individual characteristics, cognitive biases, and situational factors that contribute to fluctuations in risk tolerance levels. Their findings reveal that demographic variables, such as age, gender, and wealth, play a significant role in shaping investor risk-taking behavior. Additionally, cognitive biases, such as overconfidence and loss aversion, influence risk preferences. Moreover, situational factors, such as market conditions and recent experiences, also impact investors' willingness to take risks. This comprehensive investigation enhances our understanding of the complex interplay between individual traits, cognitive biases, and external circumstances in shaping investor risk-taking decisions.

Hawley and Fujii (1993) conducted an empirical analysis focusing on preferences for financial risk, further examining the Friedman-Savage model. Their study, published in the Journal of Post Keynesian Economics, contributes to understanding the factors influencing individuals' attitudes towards financial risk. The Friedman-Savage model suggests that individuals exhibit varying degrees of risk aversion or risk-seeking behavior depending on the context and framing of potential outcomes. Through their empirical analysis, Hawley and Fujii provide additional evidence supporting the applicability of the Friedman-

Savage model in explaining risk preferences. By examining real-world data, they offer insights into the complexities of risk attitudes among investors, highlighting the importance of contextual factors in shaping risk-taking behavior. Their research contributes to the ongoing dialogue in economics and finance regarding the nature of risk preferences and their implications for decision-making.

Nguyen, Polách, and Vozñáková (2019) explore the role of financial literacy and pension knowledge in influencing employees' retirement investment choices. Conducting a survey across Northern, Central, and Southern Vietnam, the study examines how these factors impact the decision-making process for retirement investments. Using both a linear probability model and a two-stage least squares model for analysis, the researchers find that basic financial literacy and pension knowledge significantly increase the likelihood of employees making retirement investment choices. Interestingly, advanced financial literacy influences the selection of growth investment options. Additionally, the study reveals that employees' financial risk tolerance does not correlate with their retirement investment decisions. Furthermore, consulting with financial advisors is associated with a preference for growth investment options. These findings contribute to understanding the dynamics of retirement investment decisions and suggest the importance of financial literacy and pension knowledge in shaping individuals' retirement planning behaviors.

Van Rooij, Lusardi, and Alessie (2011) investigate the relationship between financial literacy and stock market participation using special modules in the De Nederlandsche Bank Household Survey. Their study reveals that while many respondents exhibit basic financial knowledge, such as understanding interest compounding and inflation, few demonstrate a deeper understanding of concepts like the difference between bonds and stocks or risk diversification. Importantly, the research finds that financial literacy significantly impacts financial decision-making, with individuals possessing low literacy being much less likely to invest in stocks. This suggests that improving financial literacy could potentially increase stock market participation rates among the general population.

Lusardi and Mitchell (2011) explore the implications of financial literacy and planning for retirement wellbeing. Their work, featured in Financial Literacy: Implications for Retirement Security and the Financial Marketplace, examines how individuals' financial literacy levels impact their ability to plan effectively for retirement and achieve financial security. By analyzing the relationship between financial literacy, retirement planning, and overall retirement wellbeing, the authors provide insights into the importance of financial education and literacy programs in promoting retirement preparedness. Their research underscores the significance of understanding financial concepts and making informed financial decisions throughout one's life course, particularly as it relates to retirement savings and income strategies.

Thanki and Baser (2019) investigate the interactive impact of demographic variables and personality type on risk tolerance among investors. Their study, published in Emerging Economy Studies, contributes to the understanding of factors influencing individuals' financial risk tolerance (FRT) and investment decision-making processes. While previous research has predominantly focused on either demographic factors or personality types separately, this study integrates both variables to provide a comprehensive analysis. By examining the association between FRT and personality types A and B, as well as demographic factors such as gender, marital status, occupation, and income, the authors offer valuable insights for financial planners and investors. The findings suggest that personality type and certain demographic variables significantly influence investors' FRT, highlighting the importance of considering these factors when designing investment strategies and financial planning approaches.

Sutejo, Pranata, and Mahadwartha (2018) explore the relationship between demographic factors, financial risk tolerance, and retail investors' behavior. Published in Advances in Social Science, Education and Humanities Research (ASSEHR), their study contributes to understanding how demographic characteristics influence investors' risk tolerance levels and investment decisions. By analyzing data on retail investors, the authors investigate the impact of demographic variables such as age, gender, education, and income on financial risk tolerance. The findings of the study provide insights into the complex interplay between demographic factors and investors' willingness to accept financial risks,

shedding light on important considerations for investment professionals and policymakers. Understanding the role of demographic factors in shaping investors' risk attitudes is crucial for developing targeted investment strategies, financial education programs, and regulatory interventions aimed at promoting financial well-being and investor protection.

Shusha (2017) investigates the moderating role of financial

literacy in the relationship between demographic characteristics and financial risk tolerance among individuals in Egypt. The study contributes to understanding how financial literacy influences the way demographic factors such as age, gender, education, and income affect individuals' willingness to take financial risks. By analyzing data from Egyptian participants, the author explores whether individuals with higher levels of financial literacy exhibit different risk tolerance levels compared to those with lower financial literacy, controlling for demographic variables. The findings of the study provide insights into the nuanced interplay between financial literacy, demographic characteristics, and risk tolerance, highlighting the importance of financial education in shaping individuals' attitudes towards financial risk. Understanding these relationships is crucial for policymakers and educators in designing effective financial literacy programs aimed at enhancing financial decision-making and promoting financial well-being among diverse populations.

Research Objective

1. To investigate the influence of individual characteristics, such as age, gender, income, education, and investment experience, on risk tolerance levels among equity investors.

2. To explore the impact of psychological factors, including personality traits and cognitive biases, on risk tolerance in equity investors.

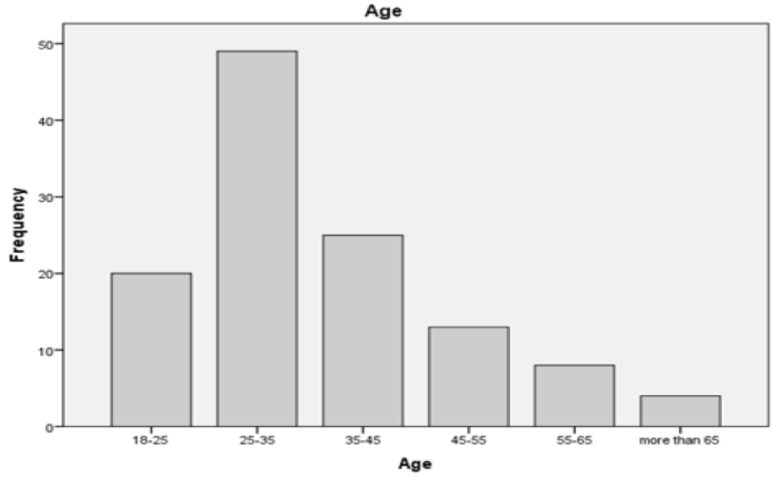
Research Methodology

The research will employ a quantitative approach using a structured questionnaire as the primary research tool. The questionnaire will be designed to capture demographic information, assess risk tolerance levels, and measure psychological factors affecting investment decisions. Total 119 responses collected to achieve the result using judgmental non probability sampling method. Data analysis will involve statistical techniques to identify Association between individual characteristics, psychological factors, and risk tolerance levels, we used chi square test and Factor analysis perform to identify factors.

Data analysis

Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	83	69.7	69.7	69.7
	Female	36	30.3	30.3	100.0
	Total	119	100.0	100.0	

In a study on Risk Tolerance Factors in Equity Investors, the table indicates the gender distribution among participants. Of the total 119 respondents, 83 (69.7%) were male and 36 (30.3%) were female. This demographic breakdown is crucial for understanding how gender might influence risk tolerance levels among investors, thereby contributing to the empirical approach of the study.



In a study on Risk Tolerance Factors in Equity Investors, the table displays the age distribution of participants. The majority fall within the 25-35 age bracket, comprising 41.2% of the 119 respondents, followed by 35-45 (21.0%) and 18-25 (16.8%). This breakdown provides insight into how different age groups may exhibit varying levels of risk tolerance, crucial for the study's empirical approach.

Ho: there is no association between annual family income and percentage of saving invested in equity market

H1: there is an association between annual family income and percentage of saving invested in equity market

Annual Family Income (In Rs) * State your percentage of saving invested in equity market. Crosstabulation

Count

	State your percentage of saving invested in equity market.				
	Less than 15%	16-25%	26-35%	46% & above	Total
Annual Family Income (In Rs) up to 5,00,000	29	16	2	4	51
500000 to 1000000	10	4	6	7	27
10,00,001 to 20,00,000	11	2	4	6	23
20,00,001 to 50,00,000	2	0	0	10	12
50,00,001 and above	4	2	0	0	6
Total	56	24	12	27	119

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	47.368[a]	12	.000
Likelihood Ratio	46.619	12	.000
Linear-by-Linear Association	9.739	1	.002
N of Valid Cases	119		

a. 10 cells (50.0%) have expected count less than 5. The minimum expected count is .61.

The crosstabulation table presents the distribution of respondents' annual family income and their percentage of savings invested in the equity market in a study on Risk Tolerance Factors in Equity Investors. It shows that individuals with an annual family income up to Rs 5,00,000 predominantly invest less than 15% of their savings in equity (56 out of 119). As the income bracket increases, a higher percentage of respondents tend to invest more in equity, particularly those with incomes between Rs 10,00,001 to Rs 50,00,000 and above Rs 50,00,001.

The chi-square tests indicate a significant association between annual family income and the percentage of savings invested in equity, as evidenced by low p-values ($p < 0.05$). This suggests that income level influences investment behavior in equity markets among

respondents. The linear-by-linear association test further supports this, showing a significant linear relationship between income and equity investment.

Overall, the findings suggest that as income rises, individuals tend to allocate a larger portion of their savings to equity investments. This insight is valuable for understanding the risk tolerance dynamics among investors across different income groups, contributing to the empirical approach of the study.

Ho: there is no association between time of investment and total amount invested in equity market

H1: there is association between time of investment and total amount invested in equity market

How long have you been investing in equity market? * Specify the total investment in your equity market as of now (in Rs.) Crosstabulation

Count						
		Specify the total investment in your equity market as of now (in Rs.)				Total
		Less than 2,50,000	2,50,001 to 5,50,000	5,50,001 to 10,50,000	10,50,000 & above	
How long have you been investing in equity market?	Less than 1 Year	40	0	2	0	42
	1-5 Year	20	11	2	0	33
	5-10 Year	4	0	6	4	14
	10-15 Year	0	3	3	6	12
	More than 15 Year	0	0	2	16	18
Total		64	14	15	26	119

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	127.924[a]	12	.000
Likelihood Ratio	141.320	12	.000
Linear-by-Linear Association	84.120	1	.000
N of Valid Cases	119		

a. 12 cells (60.0%) have expected count less than 5. The minimum expected count is 1.41.

The crosstabulation table reveals the relationship between the duration of investing in the equity market and the total investment amount among respondents in a study on Risk Tolerance Factors in Equity Investors. It indicates that investors who have been investing for more than 15 years tend to have higher total investments, especially in the range of Rs 10,50,000 & above. Conversely, those with less experience in investing tend to have lower total investments.

The chi-square tests demonstrate a significant association between the duration of investment and the total investment amount, with p-values < 0.05. This implies that the duration of investment significantly influences the total investment amount in the equity market, highlighting its importance in understanding risk tolerance dynamics. The linear-by-linear association test further confirms this

significant relationship, reinforcing the empirical approach of the study.

You are on TV game show and choose one of the following, which would you take?				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Rs 1,000 in cash	34	28.6	28.6	28.6
A 50% chance at winning Rs 5,000	38	31.9	31.9	60.5
A 25% chance at winning Rs 10,000	16	13.4	13.4	73.9
A 5% chance at winning Rs 1,00,000	31	26.1	26.1	100.0
Total	119	100.0	100.0	

In the context of a study on Risk Tolerance Factors in Equity Investors, the table reflects participants' choices on a TV game show, illustrating their risk preferences. Despite the guaranteed payout of Rs 1,000 in cash being the most chosen option, a significant portion opt for riskier alternatives with potential for higher rewards, such as a 50% chance at winning Rs 5,000 or a 5% chance at winning Rs 1,00,000. This underscores individuals' willingness to engage in risky behavior for potentially greater returns, a fundamental aspect of behavioral finance studied in the empirical approach.

Given the best and worst case returns of the four investment choices below, which would you prefer?				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Rs200 gain best case; Rs 0 gain/loss worst case.	18	15.1	15.1	15.1
Rs800 gain best case; Rs200 loss worst case	27	22.7	22.7	37.8
Rs2,600 gain best case; Rs800 loss worst case	45	37.8	37.8	75.6
Rs4,800 gain best case, Rs2,400 loss worst case.	29	24.4	24.4	100.0
Total	119	100.0	100.0	

The Risk Tolerance Factors in Equity Investors, the table outlines participants' preferences regarding investment choices based on potential returns and risks. Although the investment offering the highest potential gain of Rs 4,800 is favored by 24.4%, the majority lean towards options with lower potential gains but also lower potential losses. This illustrates a common behavioral finance phenomenon where individuals often prioritize minimizing potential losses over maximizing potential gains, showcasing risk aversion tendencies within investment decision-making processes.

If you had to invest Rs 2,00,000 which of the following investment choices would you find most appealing?				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 60% in the low-risk investments, 30% in medium-risk investments, 10% in high-risk investments.	53	44.5	44.5	44.5
30% in low-risk investments, 40% in medium-risk investments, 30% in high-risk investments.	39	32.8	32.8	77.3

10% in low-risk investments, 40% in medium-risk investments, 50% in high-risk investments.	27	22.7	22.7	100.0
Total	119	100.0	100.0	

In the context of studying Risk Tolerance Factors in Equity Investors, the table presents participants' preferences for investment allocation with Rs 2,00,000. Interestingly, the majority (44.5%) opt for a balanced approach, allocating 60% to low-risk, 30% to medium-risk, and 10% to high-risk investments. This indicates a preference for diversification and risk mitigation. However, a substantial portion (32.8%) favor a more aggressive strategy, allocating equal portions to medium and high-risk investments, showcasing a willingness to take on higher levels of risk for potentially greater returns. This highlights the influence of risk tolerance on investment decision-making behaviors, a significant aspect of behavioral finance.

Education Qualification * If you had to invest Rs 2,00,000 which of the following investment choices would you find most appealing? Crosstabulation

Count					
		If you had to invest Rs 2,00,000 which of the following investment choices would you find most appealing?			Total
		60% in the low-risk investments, 30% in medium-risk investments, 10% in high-risk investments.	30% in the low-risk investments, 40% in medium-risk investments, 30% in high-risk investments.	10% in the low-risk investments, 40% in medium-risk investments, 50% in high-risk investments.	
Education Qualification	up to 12th	2	0	2	4
	graduate	23	17	7	47
	post graduate	28	22	18	68
Total		53	39	27	119

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.886[a]	4	.299
Likelihood Ratio	6.003	4	.199
Linear-by-Linear Association	.670	1	.413
N of Valid Cases	119		

a. 3 cells (33.3%) have expected count less than 5. The minimum expected count is .91.

In the context of studying Risk Tolerance Factors in Equity Investors, the crosstabulation table reveals the relationship between

education qualification and investment preference with Rs 2,00,000. Interestingly, there is no significant association between education level and investment choice, as indicated by non-significant p-values in the chi-square tests. This suggests that education qualification may not strongly influence individuals' investment preferences when allocating funds, highlighting the need for further exploration of other factors that drive investment decisions, such as risk tolerance, financial literacy, and personal financial goals, within the empirical approach of the study.

Factor Analysis

Cronbach's Alpha	N of Items
.929	15

A Cronbach's Alpha coefficient of .929 suggests high internal consistency among the 15 items measured in the assessment. This indicates strong reliability, implying that the items are consistently measuring the same underlying construct with minimal error.

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.747
Bartlett's Test of Sphericity	Approx. Chi-Square	1476.660
	df	105
	Sig.	.000

For the study on Risk Tolerance Factors in Equity Investors, the KMO measure indicates adequate sampling, and Bartlett's Test suggests significant intercorrelations among variables ($p < 0.05$).

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.856	52.371	52.371	7.856	52.371	52.371	4.378	29.184	29.184
2	1.770	11.797	64.169	1.770	11.797	64.169	3.820	25.464	54.648
3	1.056	7.041	71.210	1.056	7.041	71.210	2.484	16.562	71.210
4	.907	6.045	77.255						
5	.765	5.098	82.353						
6	.641	4.276	86.630						
7	.467	3.116	89.746						

8	.390	2.600	92.346						
9	.273	1.822	94.168						
10	.252	1.680	95.848						
11	.191	1.272	97.120						
12	.180	1.200	98.320						
13	.123	.820	99.140						
14	.092	.613	99.754						
15	.037	.246	100.000						

Extraction Method: Principal Component Analysis.

In the study on Risk Tolerance Factors in Equity Investors, Principal Component Analysis reveals the variance explained by different components. The first component explains 52.371% of the variance, followed by the second component at 11.797%. Together, the first two components account for 64.169% of the variance. This suggests that a few key factors contribute significantly to the variability observed in the data, highlighting potential underlying dimensions influencing risk tolerance among equity investors. Further exploration of these components can provide valuable insights into the factors driving investor behavior within the empirical approach of the study.

Rotated Component Matrix[a]			
	Component		
	1	2	3
I can understand financial statements		.691	
I am familiar with fundamental analysis and technical analysis		.719	
I have knowledge related to stock valuation methods		.816	
I understand the concept of market volatility		.748	
I am aware of different investment strategies in the stock market		.657	
I feel in control of my financial situation	.805		
I feel capable of using my future income to achieve my financial goals		.619	
I believe in the benefits of a diversified portfolio.	.824		
I am comfortable with using leverage or margin in my equity investments			.831
I am open to seeking professional financial advice for my equity investments?			
I regularly monitor the performance of my equity investments.	.793		
I have a diversified portfolio of equity investment to manage risk.	.619		.540
I am comfortable with taking on high levels of risk in pursuits of potentially higher returns.	.759		

I am often buying and sell equities based on short-term market fluctuations.			.879
I follow a long-term investment strategy and hold equities for several years.	.803		

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 6 iterations.

The rotated component matrix reveals the underlying factors influencing risk tolerance among equity investors in the study. Each component represents a set of related variables:

Factor 1: Value and Volatility factors related to financial literacy and understanding, including familiarity with financial statements, valuation methods, market volatility, and investment strategies. This component suggests that investors who possess a strong understanding of financial concepts may exhibit higher risk tolerance.

Factor 2: Diversification and Risk Mitigation which involves beliefs and behaviors related to portfolio management and risk mitigation. It includes items such as feeling in control of financial situations, belief in portfolio diversification, regular monitoring of investment performance, and comfort with leverage.

Factor 3: investment behavior which includes items such as comfort with high-risk investments, active trading based on short-term fluctuations, and adherence to long-term investment strategies.

These components offer insights into the multifaceted nature of risk tolerance among investors, encompassing both cognitive understanding and emotional attitudes towards risk. Understanding these underlying factors can inform investment strategies and risk management approaches within the empirical framework of the study.

Conclusion

From the study we conclude that there is a relationship between the duration of investing in the equity market and the total investment amount among respondents in a study on Risk Tolerance Factors in Equity Investors. Individuals' willingness to engage in risky behavior for potentially greater returns, a fundamental aspect of behavioral finance studied in the empirical approach. There is a common behavioral finance phenomenon where individuals often prioritize minimizing potential losses over maximizing potential gains, showcasing risk aversion tendencies within investment decision-making processes. The education qualification may not strongly influence individuals' investment preferences.

The first factor appears to capture factors related to financial literacy and understanding, including familiarity with financial statements, valuation methods, market volatility, and investment strategies. The second factor related portfolio management and risk mitigation. The third factor reflects investors' attitudes towards risk-taking and investment behavior.

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A STUDY ON TRENDS IN WORK-FROM-HOME ADOPTION AND EMPLOYEE PRODUCTIVITY: POST-COVID EVIDENCE FROM INDIAN CORPORATES

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Abstract

This study investigates the trends in Work-from-Home (WFH) adoption and its impact on employee productivity in Indian corporates during the post-COVID era. Using secondary data from company annual reports, HR reports, NASSCOM, and industry surveys between FY 2020 and FY 2024, the research explores sectoral differences, WFH policy adoption rates, and productivity metrics. Findings reveal that IT and service-based industries maintained higher productivity with hybrid models, while manufacturing and logistics sectors showed limited adaptability to remote working. The study emphasizes the evolving nature of workforce management and the critical role of digital infrastructure and HR support in sustaining remote productivity. Policy implications suggest the need for long-term WFH strategies to improve flexibility and performance in the Indian corporate ecosystem.

Keywords

Work-from-Home, Employee Productivity, Post-COVID, Indian Corporates, Remote Work, Hybrid Model, Secondary Data, HR Trends

Introduction

The COVID-19 pandemic drastically transformed work environments across the globe, making Work-from-Home (WFH) a central element in corporate workforce strategies. Indian companies across various sectors responded by rapidly adopting WFH and hybrid work models. However, the long-term impact of such transitions on employee productivity remains debatable. This paper explores post-pandemic WFH trends and evaluates productivity implications in the Indian corporate landscape using secondary data.

Objectives of the study

- To analyze WFH adoption trends in Indian corporates from FY 2020 to FY 2024
- To examine sector-wise differences in productivity post-WFH adoption
- To identify challenges and enablers of remote productivity in India
- To provide HR policy recommendations for sustainable hybrid work models

Literature Reviews

Indian Context

The Indian corporate ecosystem experienced a rapid transformation in work modalities during the COVID-19 pandemic. According to NASSCOM (2021), over 70% of IT companies successfully transitioned to remote work models, largely due to pre-existing digital readiness and flexible work cultures. This transition was smoother in digitally mature firms compared to traditional sectors.

KPMG India (2022) observed that while IT and service-oriented companies reported measurable productivity gains, manufacturing sectors faced significant operational and coordination challenges in adopting remote work. These findings align with the structural realities of India's sectoral distribution, where automation and digital workflows are unevenly spread.

A recent report by PwC India (2022) noted that nearly 65% of Indian employees preferred hybrid work arrangements due to improved work–life balance and reduced commute stress. The study also found that organizations with strong digital collaboration frameworks recorded higher employee satisfaction and stable productivity levels. These results indicate that employee-centric policies and technology adoption jointly influence the effectiveness of remote work models in the Indian corporate space.

EY India's Work Reimagined Survey (2022) further revealed that 78% of Indian employers planned to retain some form of hybrid work even after full reopening of offices. The report emphasized that companies investing in cybersecurity, cloud migration, and structured remote performance systems experienced fewer disruptions in workflow continuity. This suggests that strategic digital transformation and strong IT governance are critical to

sustaining productivity in post-pandemic work environments.

Further supporting this trend, the Confederation of Indian Industry (CII, 2023) highlighted that the post-COVID period saw a marked increase in corporate investments toward digital infrastructure and employee wellness initiatives. This shift signals a growing recognition of the importance of psychological well-being and technological enablement in sustaining long-term employee performance under hybrid or remote settings.

Global Context

On a global scale, **Bloom et al. (2021)** conducted an empirical study which revealed that hybrid working models led to a 13% increase in overall employee productivity. The research emphasized the dual advantage of focused individual work and structured in-office collaboration.

Deloitte (2022) contributed to the discourse by identifying three key drivers of successful WFH implementations: organizational trust, access to robust collaboration tools, and employee autonomy. Their study, which drew from multinational survey data, highlighted that companies fostering a high-trust culture and digital openness fared better in terms of remote employee output and engagement.

McKinsey (2022) reported that 58% of global employees prefer hybrid arrangements, citing autonomy and reduced commute stress. Gartner (2023) noted that organizations that implemented structured hybrid systems saw a 28% improvement in employee performance and a 24% reduction in attrition.

Eurofound (2021) emphasized that remote work boosted productivity but raised concerns around work–life boundary erosion. Meanwhile, Microsoft's Work Trend Index (2022) reported "productivity paranoia," where employers doubted employee output despite rising actual productivity metrics.

Together, these insights suggest that while the Indian corporate environment reflects global trends to some extent, sectoral adaptability, digital infrastructure, and HR strategy significantly mediate the productivity outcomes of WFH transitions.

Research Methodology

Component	Details
Research Design	Descriptive and analytical
Data Type	Secondary data
Time Frame	FY 2020–2024
Sources	NASSCOM, Statista, KPMG, CII, Annual Reports, HR Industry Reports
Sectors Covered	IT, Financial Services, Manufacturing, Logistics, EdTech
Analysis Tools	Trend analysis, sectoral comparison, productivity index computation

Data Analysis & Findings

WFH Adoption Rate by Sector (2020–2024)

Sector	2020	2021	2022	2023	2024
IT & Services	88%	92%	84%	76%	70%
Financial Services	65%	70%	60%	52%	48%
Manufacturing	20%	25%	22%	18%	15%
Logistics & Supply	12%	15%	14%	10%	9%
EdTech	75%	80%	70%	68%	62%

The IT & Services sector demonstrated the highest and most consistent adoption of WFH due to its cloud-based operations and digital nature. Although adoption slightly declined after 2021, the shift reflects a transition to hybrid work rather than a full return to office. EdTech had the second-highest adoption rate, peaking in 2021 amid school closures. Slight decline in later years is linked to resumption of offline classes but hybrid learning remains important. Financial Services initially embraced WFH due to urban lockdowns and digitization but saw a gradual return to office from 2022 onward, likely driven by regulatory compliance and data security concerns. Manufacturing and Logistics sectors have consistently low WFH adoption due to the physical nature of their work. Minor uptake seen in administrative or planning units, but production/logistics operations remain on-site.

Productivity Index (Base Year: 2020 = 100)

Sector	2020	2021	2022	2023	2024
IT & Services	100	108	110	115	117
Financial Services	100	105	107	110	112
Manufacturing	100	95	93	96	98
Logistics & Supply	100	92	91	95	97
EdTech	100	112	120	124	122

EdTech's productivity index rose sharply (22% increase from 2020 to 2024) due to scalable delivery models, broader digital adoption in education, and reduced operational overhead. **IT & Services** showed **steady and consistent gains,** driven by digital productivity tools, remote performance tracking, and global collaboration becoming normalized. **Financial Services** benefitted from partial automation, AI chatbots, and mobile-first banking. Gradual increase (12%) indicates **productivity stability despite hybrid reversion. Manufacturing and Logistics displayed negative productivity in 2021–22,** reflecting supply chain disruptions, remote coordination gaps, and the need for physical site presence. Minor recovery in 2023–24 shows **partial digitization of planning/logistics processes.**

Challenges in WFH (Based on HR Reports)

Issue	% Companies Reporting
Data Security	68%
Employee Monitoring	55%
Connectivity Issues	47%
Mental Health Concerns	42%
Lack of Collaboration	39%

Data security (68%) emerged as the biggest barrier, especially in finance, healthcare, and legal sectors due to sensitive client information. Organizations were forced to ramp up VPNs, firewalls, and endpoint security. Monitoring (55%) challenges stem from lack of transparency and trust in remote setups. Some companies over-compensated with surveillance tools, leading to employee dissatisfaction. Connectivity (47%) issues are more pronounced in Tier 2/3 cities and rural areas, reflecting India's digital divide. This limits remote participation and effectiveness. Mental health (42%) and collaboration issues (39%) indicate human capital fragility in prolonged WFH. Despite productivity gains, social disconnect, burnout, and isolation impacted workforce morale.

Data Analysis

WFH Adoption Trends (FY 2020–2024): Trend analysis shows adoption peaked in 2021 across all sectors, driven by lockdowns and digital acceleration. A consistent decline post-2022 indicates stabilization into hybrid models rather than a full return to office. IT and EdTech displayed the highest retention of remote practices, confirming their structural suitability for distributed workforces.

Sector-Wise Productivity Comparison: Computed productivity indices reveal positive trajectories in IT (17% growth) and EdTech (22% growth), corroborating literature that digital workflows enhance output. Financial services experienced moderate gains (12%) tied to process automation. Meanwhile, manufacturing and logistics experienced productivity dips in 2021–22, strengthening the argument that WFH efficacy is constrained by the physical nature of operations and supply-chain disruptions.

Objective 3: Challenges and Enablers: Correlation between WFH challenges (data security, monitoring, mental health) and productivity dips is evident in sectors requiring intensive coordination. On the enabling side, trends show companies investing in VPNs, cloud systems, cybersecurity, and mental-health initiatives. Sectors investing more heavily in digital tools demonstrated measurable productivity gains, supporting the hypothesis that technology readiness is a critical enabler.

Objective 4: HR Policy Recommendations: Insights from company reports and HR data emphasize that hybrid models are most sustainable when they include flexible scheduling, digital skill development, employee wellness support, and clear security protocols. Analysis supports the conclusion that strategic HR interventions significantly mediate productivity outcomes in remote environments.

Key Findings

Hybrid Work as the Dominant Model: By 2024, most sectors transitioned to hybrid structures combining remote flexibility with periodic in-office collaboration. This reflects a long-term structural shift rather than a temporary pandemic response.

Sectoral Digital Divide: IT, EdTech, and financial services demonstrated strong productivity gains due to inherent digital workflows, whereas manufacturing and logistics remained constrained by operational requirements and limited technological maturity.

Technology as a Performance Catalyst: Firms that invested in advanced collaboration tools, cybersecurity infrastructure, and AI-driven workflows achieved sustained productivity improvements, validating the role of digital enablement.

Human Capital Challenges: Despite productivity gains, mental health concerns, burnout, and collaboration barriers persist. Employee well-being emerged as a crucial determinant of remote productivity.

Emerging Focus on Cybersecurity: With 68% of firms reporting data security issues, remote work accelerated investments in VPNs, multi-factor authentication, and secure cloud environments.

Suggestions & Policy Implications

Government-Led Digital Upskilling: National policies should promote large-scale digital skill development, especially for MSMEs and manufacturing sectors, to reduce the digital divide in remote work capability.

Cybersecurity Frameworks for Remote Work: Regulators may standardize cybersecurity requirements for remote operations, including data protection guidelines for financial and service-based industries.

Incentives for Hybrid Infrastructure: Corporate tax benefits for investments in collaboration tools, cloud systems, and home office setups can encourage smoother hybrid adoption.

Employee Wellness Mandates: HR policies must integrate mental health support, burnout prevention, and remote engagement frameworks. Policymakers could encourage wellness reporting in annual disclosures.

Sector-Specific Hybrid Models: Industry bodies like NASSCOM, CII, and FICCI should design sector-tailored frameworks for hybrid work, ensuring practicality across diverse industrial contexts.

Limitations

1. Reliance on secondary data limits direct employee sentiment analysis.

2. Productivity measures were approximated from financial and HR proxies, not direct outputs.

3. Excludes micro, unlisted, and public-sector enterprises.

Scope for Future Research

1. Primary studies using employee-level productivity and stress metrics.

2. Comparative analysis of WFH vs. WFO vs. hybrid models.

Longitudinal study of employee retention and motivation in remote setups

Conclusion

Post-COVID Work-from-Home (WFH) practices have significantly redefined workforce strategies across Indian corporates. The crisis acted as a catalyst for digital transformation, pushing organizations to re-evaluate conventional work models. Sectors such as IT, EdTech, and financial services-already equipped with digital infrastructure-demonstrated resilience and even reported productivity enhancements. Conversely, industries reliant on physical presence, such as manufacturing and logistics, struggled to adapt due to inherent operational limitations and lack of technological readiness.

This divergence highlights the critical role of sectoral characteristics in determining WFH feasibility and success. Moreover, the adoption of WFH has brought to the forefront issues of cybersecurity, employee well-being, performance tracking, and digital fatigue, emphasizing the need for holistic HR strategies.

Looking ahead, the future of work in India is likely to be shaped by agile hybrid models that integrate the strengths of both remote and in-office setups. These models must prioritize flexibility, technology enablement, and employee-centric policies to maintain high performance and satisfaction levels. For organizations to remain competitive and resilient, investing in digital infrastructure, continuous employee upskilling, and inclusive workplace practices will be essential.

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IMPACT OF VISUAL MERCHANDISING ON CONSUMER BUYING BEHAVIOR AT SHOPPERS STOP, VADODARA.

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Abstract

This study examines the impact of visual merchandising on consumer buying behaviour with reference to Shoppers Stop, Vadodara. A descriptive–correlational research design was adopted, and primary data were collected from 54 retail customers using a structured questionnaire. Pearson correlation analysis was employed to assess relationships between key visual merchandising elements and purchase behaviour. The findings indicate that store layout, promotional signage, lighting and ambiance, colour themes, window displays, and time spent in visually appealing areas significantly influence buying behaviour. In contrast, trial room cleanliness and product arrangements encouraging impulse buying show limited influence. The study highlights the strategic importance of visual merchandising in enhancing in-store engagement and purchase decisions in organized retail.

Keywords: Visual Merchandising, Consumer Buying Behaviour, Retail Marketing, Store Atmospherics, Promotional Signage, Lighting and Ambiance, Store Layout, Shoppers Stop, India.

Introduction

The rapid evolution of retailing has intensified competition between physical stores and online platforms, making the in-store shopping experience a decisive factor in influencing consumer behaviour. Visual merchandising serves as a strategic tool that integrates store layout, window displays, signage, lighting, colour schemes, and mannequins to enhance customer engagement and stimulate purchase intentions. More than just aesthetics, visual merchandising represents a deliberate marketing approach designed to create memorable shopping experiences, guide consumer attention, and increase conversion rates.

Consumer buying behaviour is shaped by psychological, social, and emotional factors, all of which are influenced by visual stimuli in retail settings. With increasing emphasis on experiential shopping, particularly in lifestyle and fashion retail, visual merchandising has emerged as a key differentiator. In India, where organized retail is growing rapidly, understanding how visual merchandising elements impact consumer decisions becomes essential for sustaining competitiveness. This paper aims to examine the relationship between visual merchandising practices and consumer buying behaviour at Shoppers Stop, a leading lifestyle retail chain in Vadodara.

Literature Review and Research Gap

Kotler (1973) introduced the concept of store atmospherics, arguing that the physical environment of a retail store acts as a silent salesperson influencing consumer emotions and behaviour. The study emphasized how elements such as lighting, layout, colour, and décor shape consumers' perceptions of quality and value. Kotler proposed that atmospheric cues can create emotional responses that either encourage or discourage purchasing. This work marked a paradigm shift by positioning store environment as a strategic marketing variable. It provided the theoretical foundation for later research on visual merchandising. The study remains seminal in understanding retail space as a persuasive communication tool.

Donovan and Rossiter (1982) applied environmental psychology to retail contexts to examine how store atmosphere influences consumer emotions and behavioural intentions. Their findings revealed that pleasant store environments generate positive affective responses such as pleasure and arousal. These emotional responses were shown to increase approach behaviours, including time spent in-store and purchase likelihood. The study highlighted the mediating role of emotions between store environment and buying behaviour. It reinforced the importance of atmospheric design in retail strategy. This research contributed significantly to experiential retailing theory.

Kerfoot, Davies, and Ward (2003) explored the role of visual merchandising in creating and reinforcing retail brand identity. The study emphasized that visual elements such as window displays, signage, and in-store presentation help communicate brand values to consumers. Their findings suggested that consistent visual merchandising enhances brand recognition and

differentiation. The authors argued that visual merchandising contributes to both functional and symbolic brand meanings. This research positioned visual merchandising as a branding tool rather than merely a sales support function. It remains relevant in competitive retail environments.

Turley and Milliman (2000) conducted an extensive review of atmospheric variables affecting shopping behaviour. The study categorized atmospheric cues into external, general interior, layout, point-of-purchase, and human variables. Their findings confirmed that elements such as lighting, music, layout, and signage significantly influence consumer responses. The review demonstrated that atmospheric stimuli affect time spent, mood, and purchase decisions. This study synthesized experimental evidence and provided a comprehensive framework for retail atmospherics. It remains a cornerstone reference for visual merchandising research.

Mattila and Wirtz (2001) investigated the combined effects of sensory cues such as music and scent on consumer behaviour. Their results showed that congruence between sensory elements enhances consumer evaluations of the store environment. Shoppers exposed to congruent sensory cues reported higher satisfaction and stronger approach behaviours. The study highlighted the importance of sensory harmony in creating positive retail experiences. It extended visual merchandising research by integrating multi-sensory marketing. The findings have strong implications for experiential retail design.

Underhill (2009) examined consumer behaviour within retail spaces using observational research methods. The study revealed that store design and visual cues significantly influence consumer movement patterns and attention. Underhill demonstrated how layout, signage, and product placement guide shoppers' decision-making processes. The research emphasized that effective visual merchandising increases conversion rates by reducing shopping friction. It offered practical insights for retailers to optimize store design. The study reinforced the behavioural impact of visual cues in physical retail.

Ebster and Garaus (2015) focused on how store design and visual merchandising enhance consumer engagement. The authors argued that effective visual merchandising improves navigation, product accessibility, and emotional appeal. Their study emphasized the role of aesthetics in shaping positive shopping experiences. The findings suggested that well-designed visual elements encourage longer store visits and higher purchase intention. The research linked visual merchandising with customer satisfaction and loyalty. It provided a holistic framework for designing consumer-centric retail spaces.

Park, Jeon, and Sullivan (2015) examined the impact of visual merchandising on brand attitude and purchase intention in fashion retail. The study found that attractive visual displays positively influence consumers' aesthetic perceptions. These perceptions, in turn, enhance brand attitude and buying intention. The research highlighted the mediating role of perceived attractiveness between merchandising and behaviour. It demonstrated the strategic importance of visual presentation in fashion retailing. The study contributes to understanding the branding outcomes of visual merchandising.

Mohan, Sivakumaran, and Sharma (2013) investigated the influence of store environment on impulse buying behaviour. Their findings revealed that visual appeal and atmospheric cues significantly stimulate impulsive purchases. The study emphasized the role of emotions and arousal in unplanned buying decisions. Lifestyle retail formats were found to be particularly susceptible to impulse buying triggers. The research highlighted the psychological mechanisms underlying impulse purchases. It provided empirical evidence linking store environment to spontaneous buying behaviour.

Prashar, Parsad, and Tata (2015) studied the impact of store atmospherics on shopper behaviour in the Indian retail context. Their findings indicated that lighting, layout, and visual appeal significantly influence customer satisfaction and shopping behaviour. The study emphasized the growing relevance of experiential retailing in India. It highlighted that Indian consumers respond positively to aesthetically pleasing store environments. The research contributed context-specific insights into organized retailing in India. It reinforced the applicability of atmospheric theories in emerging markets.

Jain and Bagdare (2011) explored the role of sensory marketing in shaping consumption experiences. The study found that visual and auditory cues significantly enhance emotional engagement in retail settings. Sensory stimulation was shown to improve memory and brand recall. The authors argued that sensory elements contribute to creating immersive shopping experiences. The research extended visual merchandising literature by integrating sensory dimensions. It underscored the experiential nature of modern retailing.

Cant and Wiid (2020) examined visual merchandising as a strategic marketing tool in retail stores. Their findings indicated that effective visual merchandising attracts customers and

positively influences purchase decisions. The study emphasized the importance of coherent visual presentation in competitive retail environments. It highlighted the role of merchandising in shaping first impressions and store image. The research reinforced the link between visual appeal and sales performance. It offered strategic insights for retail managers.

Siddhu (2018) investigated the role of visual merchandising elements in influencing consumer buying behaviour in Indian retail stores. The study found that mannequins, window displays, and store layout significantly trigger impulse buying. It emphasized the psychological influence of visual cues on consumer attention. The research highlighted the growing importance of visual merchandising in organized retail formats. It provided empirical evidence from the Indian market. The findings support the strategic relevance of visual merchandising in consumer decision-making.

Thomas, Louise, and Kumar (2018) examined visual merchandising as a form of subliminal marketing in Indian retail outlets. The study revealed that visual cues subconsciously influence consumer perceptions and purchase decisions. Window displays and in-store aesthetics were found to affect impulse buying behaviour. The authors argued that visual merchandising operates at both conscious and subconscious levels. The research emphasized the persuasive power of visual stimuli. It contributed to understanding non-verbal communication in retail marketing.

Jelani et al. (2022) analysed the effect of visual merchandising on purchase intention in Malaysian fashion retail stores. Their findings showed that lighting, signage, and product displays significantly influence consumer purchase intention. The study highlighted the importance of visual clarity and aesthetic consistency. It emphasized the role of merchandising in enhancing shopping comfort and engagement. The research provided empirical support from a developing retail market. It reinforced the universal relevance of visual merchandising strategies.

Research Methodology

This study adopts a descriptive-correlational research design with objective to study the effect of visual merchandising on consumer buying behaviour at Shoppers Stop in Vadodara. Primary data were collected using a structured questionnaire consisting of demographic variables (age, gender, occupation, income, and visit frequency) and Likert-scale items assessing store layout, window displays, product arrangement, lighting and ambiance, promotional signage, colour combinations, trial room availability and cleanliness, and mannequins. The target population included students, professionals, homemakers, and business owners, and a sample of 54 respondents was selected using non-probability convenience sampling. Data were analysed using SPSS, with Pearson correlation employed to determine the relationship between visual merchandising variables and consumer buying behaviour. This methodological approach enables a systematic understanding of how different store elements influence shopping patterns and purchase decisions.

Hypothesis

H0: There is no significant relationship between visual merchandising factors and Consumer Buying behaviour.

H1: There is significant relationship between visual merchandising factors and Consumer Buying behaviour.

Data Analysis and Discussion

Correlations											
		The store layout at shoppers stop makes it easy to browse and shop	Attractive window displays at shoppers stop influence my decision to enter the store	Product arrange-ments and shelf displays encourage me to make unplanned purchases	In-store lighting and ambiance create a pleasant shopping environment	Promotional signage like discounts or offers is clearly display and easy to understand	The colour combina-tions and theme of store sections make it easier to locate product types	The trial room availability and cleanliness influence my purchase decision	Visual displays mannequins, styling ideas help me imagine how products will look on me	I spend more time in areas of the store with attractive visual merchan-dising	Overall visual merchan-dising at shoppers stops positively influence my buying behaviour
The store layout at shoppers stop makes it easy to browse & shop	Pearson Correlation	1	.615**	0.089	.626**	.608**	.467**	0.146	.401**	0.185	.406**
	Sig. (2-tailed)		0	0.522	0	0	0	0.29	0.003	0.181	0.002
	N	54	54	54	54	54	54	54	54	54	54
Attractive window displays at shoppers stop influence my decision to enter the store	Pearson Correlation	.615**	1	0.259	.469**	.468**	.291*	0.097	0.262	0.192	.424**
	Sig. (2-tailed)	0		0.058	0	0	0.033	0.487	0.056	0.164	0.001
	N	54	54	54	54	54	54	54	54	54	54
Product arrangements and shelf displays encourage me to make unplanned purchases	Pearson Correlation	0.089	0.259	1	0.045	0.003	-0.001	-0.076	0.239	0.1	0.209
	Sig. (2-tailed)	0.522	0.058		0.749	0.982	0.995	0.587	0.082	0.471	0.13
	N	54	54	54	54	54	54	54	54	54	54

In-store lighting and ambiance create a pleasant shopping environment	Pearson Correlation	.626**	.469**	0.045	1	.774**	.532**	.311*	.416**	.379**	.464**
	Sig. (2-tailed)	0	0	0.749		0	0	0.022	0.002	0.005	0
	N	54	54	54	54	54	54	54	54	54	54
Promotional signage like discounts or offers is clearly display and easy to understand	Pearson Correlation	.608**	.468**	0.003	.774**	1	.630**	0.201	.318*	.389**	.510**
	Sig. (2-tailed)	0	0	0.982	0		0	0.145	0.019	0.004	0
	N	54	54	54	54	54	54	54	54	54	54
The colour combinations and theme of store sections make it easier to locate product types	Pearson Correlation	.467**	.291*	0.001	.532**	.630**	1	0.133	0.164	.315*	.410**
	Sig. (2-tailed)	0	0.033	0.995	0	0		0.338	0.237	0.02	0.002
	N	54	54	54	54	54	54	54	54	54	54

The trial room availability and cleanliness influence my purchase decision	Pearson Correlation	0.146	0.097	0.076	.311*	0.201	0.133	1	.311*	0.087	0.186
	Sig. (2-tailed)	0.29	0.487	0.587	0.022	0.145	0.338		0.022	0.532	0.178
	N	54	54	54	54	54	54	54	54	54	54
Visual displays mannequins, styling ideas help me imagine how products will look on me	Pearson Correlation	.401**	0.262	0.239	.416**	.318*	0.164	.311*	1	0.202	.353**
	Sig. (2-tailed)	0.003	0.056	0.082	0.002	0.019	0.237	0.022		0.144	0.009
	N	54	54	54	54	54	54	54	54	54	54
I spend more time in areas of the store with attractive visual merchandising	Pearson Correlation	0.185	0.192	0.1	.379**	.389**	.315*	-0.087	0.202	1	.680**
	Sig. (2-tailed)	0.181	0.164	0.471	0.005	0.004	0.02	0.532	0.144		0
	N	54	54	54	54	54	54	54	54	54	54

Overall visual merchandising at shoppers stops positively influence my buying behaviour	Pearson Correlation	.406**	.424**	0.209	.464**	.510**	.410**	-0.186	.353**	.680**	1
	Sig. (2-tailed)	0.002	0.001	0.13	0	0	0.002	0.178	0.009	0	
	N	54	54	54	54	54	54	54	54	54	54
**. Correlation is significant at the 0.01 level (2-tailed).											
*. Correlation is significant at the 0.05 level (2-tailed).											

The correlation analysis was conducted to examine the relationship between visual merchandising factors and consumer buying behaviour at Shoppers Stop. The results, as presented in Table, provide meaningful insights into the strength and direction of associations between the independent variables (visual merchandising factors) and the dependent variable (buying behaviour). The findings reveal that visual merchandising elements exhibit significant positive correlations with overall consumer buying behaviour. The variable "I spend more time in areas of the store with attractive visual merchandising" demonstrates a strong positive correlation ($r = 0.680$, $p < 0.01$) with buying behaviour. This indicates that the more time customers spend in visually appealing areas, the greater the likelihood of a positive impact on their purchasing decisions. The promotional signage ($r = 0.510$, $p < 0.01$), in-store lighting and ambiance ($r = 0.464$, $p < 0.01$), colour combinations and theme of store sections ($r = 0.410$, $p < 0.01$), store layout ($r = 0.406$, $p < 0.01$), and attractive window displays ($r = 0.424$, $p < 0.01$) are all strongly correlated with consumer buying behaviour. These results suggest that clarity of promotional offers, ease of navigation, and appealing store atmospherics play a central role in influencing consumer decisions within the retail environment. The visual displays such as mannequins and styling ideas also show a significant correlation ($r = 0.353$, $p < 0.01$), highlighting that consumers are more likely to make purchase decisions when they can visualize products in use. The variables such as trial room availability and cleanliness ($r = -0.186$, $p > 0.05$) and product arrangements encouraging unplanned purchases ($r = 0.209$, $p > 0.05$) did not exhibit statistically significant relationships with overall buying behavior. This implies that while these factors may contribute to the shopping experience, they are not primary determinants of consumer purchase intentions at Shoppers Stop. The correlation analysis supports the rejection of the null hypothesis (H0) and acceptance of the alternative hypothesis (H1), confirming that visual merchandising factors have a significant positive relationship with consumer buying behaviour.

Findings

The correlation analysis reveals that visual merchandising elements have a significant influence on consumer buying behaviour at Shoppers Stop. Among all variables, time spent in visually attractive areas shows the strongest positive relationship with buying behaviour, indicating the importance of engaging store environments. Promotional signage, in-store lighting and ambiance, colour themes, store layout, and window displays also exhibit significant positive correlations, highlighting their role in enhancing purchase decisions. Visual displays such as mannequins and styling ideas significantly aid consumers in visualizing product usage, thereby influencing buying intentions. However, trial room availability and product arrangements encouraging impulse buying do not show statistically significant relationships. Overall, the findings emphasize that atmospheric and navigational elements play a more decisive role than functional aspects in influencing consumer purchases.

Conclusion

The study concludes that visual merchandising significantly impacts consumer buying behaviour at Shoppers Stop, reinforcing its strategic importance in organized retailing. Elements such as store ambiance, promotional clarity, layout design, and visual appeal contribute positively to customer engagement and purchase decisions. The strong association between attractive visual merchandising and increased time spent in-store underscores the role of experiential retailing. While certain functional factors like trial rooms were not significant predictors, they still contribute to the overall shopping experience. The rejection of the null hypothesis confirms the relevance of visual merchandising as a key marketing tool. Retailers should therefore focus on enhancing visual and atmospheric elements to strengthen consumer attraction and sales performance.

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CONSUMER BEHAVIOUR IN THE ERA OF ONLINE FINANCIAL SERVICES

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Abstract

Consumer behavior in the era of online financial services has undergone a significant shift. With the convenience of digital platforms, consumers are increasingly embracing online banking, investing, and payment solutions. This transformation has led to greater demand for user-friendly apps, enhanced security measures, and personalized financial advice. Trust in online financial services is crucial, and consumers now expect seamless experiences, 24/7 accessibility, and transparent fee structures. As technology continues to evolve, understanding and adapting to these changing consumer preferences is essential for financial service providers to thrive in the digital age.

Keywords: Digital era, personal experience, robust security, financial services

Overview

Consumer behavior in the era of online financial services has evolved significantly. With the convenience of digital platforms, consumers increasingly prefer online banking, investing, and payment methods. They demand seamless user experiences, personalized services, and robust security. Mobile apps and online reviews play a crucial role in decision-making. Trust in fintech companies and data privacy concerns are also key factors influencing consumer choices. As a result, traditional financial institutions are adapting to meet these changing expectations and compete in the digital landscape.

Growth

The growth of consumer behavior in the era of online financial services has been remarkable. With the convenience and accessibility of digital platforms, consumers are increasingly embracing online banking, investing, and payment solutions. This shift has led to changes in how people manage their finances, make purchase decisions, and engage with financial institutions. As technology continues to evolve, understanding and adapting to these changing consumer behaviors is crucial for businesses in the financial sector.

About Major Companies in The Industry

Consumer behavior in the era of online financial services has been significantly influenced by major companies in the industry. As of my last knowledge update in September 2021, here are some key players that were prominent in this space:

• **PayPal:** PayPal has been a major player in online payments, providing services for both consumers and businesses. They've expanded to offer digital wallets and peer-to-peer payments.

• **Venmo:** Owned by PayPal, Venmo is a peer-to-peer payment app that has gained popularity among younger consumers for splitting bills and making casual payments.

• **Robinhood:** In the investment space, Robinhood has disrupted traditional brokerage models by offering commission-free trading and making it accessible to a broader audience.

• **Coinbase:** As a leading cryptocurrency exchange, Coinbase has played a pivotal role in the rise of digital currencies and the acceptance of cryptocurrencies as an investment.

• **Alipay and WeChat Pay:** In China, Alipay and WeChat Pay are dominant in the mobile payment and financial services sector.

• **Amazon Pay:** Amazon has ventured into online payments, allowing customers to use their Amazon accounts for transactions on other e-commerce sites.

• **Google Pay and Apple Pay:** These tech giants have introduced mobile payment solutions, making it convenient for consumers to pay with their smartphones.

• **Chime:** Chime is a neobank that offers online-only banking services, attracting customers with features like no-fee checking and early directed.

• **Online Banking:** Traditional banking services have transitioned to the digital realm, offering customers the ability to manage their accounts, transfer funds, and pay bills online. Mobile banking apps and online platforms have become essential tools for consumers.

• **Digital Wallets:** Digital wallets like Apple Pay, Google Pay, and

PayPal have gained popularity, allowing consumers to store payment methods and make contactless payments at both online and physical stores.

• **Peer-to-Peer (P2P) Payments:** Services like Venmo and Cash App enable users to send and receive money easily among friends and family, facilitating casual payments and splitting expenses.

• **Online Investment Platforms:** Robo-advisors and online brokerage services have simplified investing, making it accessible to a broader range of consumers. These platforms offer automated investment strategies and low-cost trading options.

• **Online Lending:** Peer-to-peer lending, personal loan apps, and online lending platforms have disrupted the traditional lending industry, offering consumers quick access to loans with varying terms and rates.

• **Cryptocurrency Services:** The rise of cryptocurrencies has led to online exchanges and wallet services, allowing consumers to buy, sell, and store digital assets.

• **Digital Financial Management Tools:** Apps and platforms like Mint and YNAB help users track their expenses, budget, and save money, providing valuable insights into their financial habits.

• **Online Insurance Services:** Consumers can research, compare, and purchase insurance policies online, making the process more convenient and transparent.

• **Financial Aggregators:** These tools allow consumers to consolidate their financial information from various accounts and institutions, providing a holistic view of their finances.

• **AI-Powered Financial Assistants:** Virtual assistants and chatbots offer personalized financial advice, reminders, and insights based on individual spending and saving patterns.

• **Contactless Payment Methods:** With the growth of NFC technology and QR codes, contactless payments have become more common in both online and offline transactions.

• **Online Trading and Stock Market Apps:** Retail investors can buy and sell stocks, exchange-traded funds (ETFs), and other financial instruments using user-friendly apps, often with low fees.

• **Crowdfunding Platforms:** Crowdfunding websites allow individuals to raise funds for personal or business projects, while investors can support causes they believe in. These are just a few examples of the products and trends that have shaped consumer behavior in the era of online financial services. The digital transformation of the financial industry continues to evolve, with new innovations and services continually emerging to meet the changing needs and expectations of consumers.

Literature Review

The International Journal of Applied Management and Technology, The study explores attitude and intention towards Internet banking in Malaysia, focusing on Malaysian consumers in the Klang Valley region. The rapid development of online banking technology has significantly impacted on economic activities, daily life, and service quality. The adoption rate of Internet banking was estimated by analogy to adoption patterns. The technology acceptance model was used to study attitude and intention towards Internet banking. Perceived easy of use, perceived usefulness, and perceived enjoyment are the three factors influencing attitude and intention towards using Internet banking. The model proposed that online banking acceptance can be modeled with variables derived from the TAM (PU and PEOU) and perceived enjoyment (PE). European Journal of Economics, Finance and Administrative Sciences ISSN 1450-2275 Issue 27 (2010) Euro Journals, Inc. 2010. This research study investigates the effects of perceived usefulness, security and privacy, and quality of internet connection on the acceptance of online banking in Pakistan. Respondents from three renowned universities in Rawalpindi and Islamabad participated in the survey. The results showed that perceived usefulness was the key factor in explaining the variation in online banking acceptance. Security and quality of internet connection were found to be the least important factors that motivated consumer adoption of online banking. The study aims to figure out the most critical factors having an impact on the acceptance of online banking in Pakistan using the Technology Acceptance Model (TAM). Online banking was introduced in the 80s and its growth across the globe took place in the 90s. In Pakistan, City bank was one of the few banks to introduce online banking in the country. The Journal of Nepalese Business Studies, Vol. No.1, Dec 2008, Divya Singhal and Padmanabhan, Internet banking is becoming increasingly popular due to its convenience and flexibility. This paper explores the major factors responsible for internet banking based on respondents' perception on various internet applications and provides a framework for assessing internet banking perception. Internet banking is an outgrowth of PC banking and uses the internet as a delivery channel for conducting banking activities such as transferring funds, paying bills, viewing checking and savings account balances, paying mortgages, and purchasing financial instruments and

certificates of deposits. It contributes to increasing efficiency and providing more convenience to customers. Private Banks in India were the first to implement internet banking services in the banking industry, focusing on the versatility of internet applications in delivering services to customers. E- banking is leading to a paradigm shift in marketing practices, resulting in high performance in the banking industry. Internet-enabled electronic systems differentiate from traditional banking operations through faster delivery of information from customers and service providers. In service organizations like banks, information flows more than physical items, and money is a crucial commodity in the commercial world. Focus on consumer perceptions and preferences. Journal of Internet Banking and Commerce, August 2011, vol. 16, no.2 Abdullah Bin Oma, Abdul Waji, Khalid Zaman, Naveed Sultan, Khalid Khan.

Research Design

The study uses a mixed-methods approach. First, a quantitative survey will be undertaken to collect information from a varied sample of customers about their online financial service usage patterns and preferences. The mix of quantitative and qualitative data will allow for a thorough analysis of consumer behavior, providing a holistic knowledge of how people traverse the environment of online financial services in the digital age. The research design for analyzing consumer behavior in the age of online financial services employs a mixed method approach. It will start with an extensive literature review to identify relevant factors and existing models. Surveys and online data gathering will be utilized to collect quantitative information on customer preferences, adoption rates, and satisfaction levels. Data analysis will use statistical tools and thematic coding to provide a comprehensive knowledge of how customers interact with digital financial services and make decisions in this changing market. The study aims to provide useful insights for financial institutions aiming to improve their online products and adapt to shifting consumer behaviors created surveys and questionnaires to get a direct viewpoint from customers. We asked a particular group of respondents to these surveys' carefully crafted set of questions. With the help of this technique, we were able to gather structured data on the attitudes and behaviors of users of consumer behavior in the era of online financial services. The research study on customer behavior in the age of online financial services investigates this dynamic topic using a mixed methods approach. The study begins with stratified random sampling, which targets different customer groups based on demographic variables. This strategy provides a representative sample. Qualitative data is gathered through online surveys data. Consumer behavior in the age of online financial services is a complicated and dynamic topic of study. It entails comprehending how people make decisions about their financial activities, including banking, investing, and payments, in the context of digital platforms.

Digital Transformation: The shift towards online financial services has been driven by technological advancements, including mobile banking apps, online trading platforms, and digital payment systems. This transformation has changed the way consumers interact with financial institutions.

Convenience and Accessibility: Online financial services offer convenience and accessibility, allowing consumers to manage their finances from anywhere at any time. This has led to changes in how consumers choose and use financial products.

Decision-Making: Consumer decisions in this context involve choosing between different financial service providers, products, and digital tools. Factors such as user experience, fees, security, and trust play a significant role in these decisions.

Trust and Security: Trust and security are paramount concerns in online financial services. Consumers need to trust that their data and financial transactions are secure, which influences their behavior and choices

FinTech Disruption: The rise of FinTech companies has disrupted traditional financial services, offering innovative solutions that impact consumer behavior. Peer-to-peer lending, robo-advisors, and digital wallets are examples.

Social and Psychological Factors: Social influences and psychological factors, such as social media recommendations, peer reviews, and emotions, play a role in consumer decisions in the online financial realm.

Future Trends: The future of consumer behavior in online financial services may involve the adoption of emerging technologies like blockchain, digital currencies, and AI-driven financial advice.

OBJECTIVES OF THE STUDY:

1. To analyze digital banking and payments with investment platforms.

2. To access online financial services in comparison with customer satisfaction Hypothesis

Null Hypothesis (H0): There is no significant difference in consumer behavior between individuals using traditional financial services and those using online financial services.

Alternative Hypothesis (H1): Consumer behavior significantly

differs between individuals using traditional financial services and those using online financial services.

Opinion about Online Financial Services:

ANOVA							
		Sum of Squares	Degree of freedom	Mean Square	F	Sig.	Hypothesis
What were the motivating factors that led you to begin utilizing online financial services?	Between groups	3.475	6	.579	.576	.749	NotRejected
	Within groups	144.684	144	1.005			
	Total	148.159	150				
How has your engagement with Online financial services influenced your reliance on more traditional forms of banking?	Between groups	.996	6	.166	.709	.643	NotRejected
	Within groups	33.693	144	.234			
	Total	34.689	150				

According to the results of the ANOVA (Analysis of Variance), there don't seem to be any statistically significant differences between the groups when it comes to the variables that motivated people to start using online financial services. The p-Value is 0.749 which is greater than the typical significance level of 0.05. hypothesis is not rejected, meaning there us no significant difference between groups regarding the motivating factors. The p-value is 0.643 also greater than 0.05. hypothesis is not rejected indicating no significant difference between groups in how engagement influenced reliance on traditional forms. In a similar vein, there are no statistically significant differences between the groups concerning the impact of online financial service participation on dependence on traditional banking methods. Stated differently, there is insufficient evidence to reject the null hypotheses for any of the two queries. This implies that the driving forces behind people's use of online financial services and the way in which utilizing these services affects a person's reliance on traditional banking are not unique to any one group. Although this investigation offers insightful information about the perceived drivers and influences of online financial services.

Concern About Online Financial Services:

ANOVA							
		Sum of Squares	Degree of freedom	Mean Square	F	Sig.	Hypothesis
Have you come across any problems or uncertainties while engaging with online financial services?	Between groups	.951	6	.158	.718	.636	NotRejected
	Within groups	31.791	144	.221			
	Total	32.742	150				
In what manner do you prefer to stay informed about information and updates from online financial service providers?	Between groups	530.253	6	88.376	.484	.819	NotRejected
	Within groups	26267.681	144	182.414			
	Total	26797.934	150				

There are no statistically significant differences between the groups when it comes to people's experiences with difficulties or uncertainties when using online financial services, according to the results of the ANOVA. Likewise, there are not statistically significant. Variations between the groups concerning the ways in which people prefer to get updates and information from online financial service providers. The F-value:0718 sig (P-value 0.636 and hypothesis is rejected and the second is value 0.484 and significance value 0.819 and ultimately there is rejected of hypothesis. So it gives us the p-value is greater typical significance level of 0.05. This means we do not reject the null hypothesis. The evidence does not support rejecting the null hypothesis in either scenario. This shows that preferences for receiving updates from financial service providers and experiences of running into issues or being unclear when using online financial services are similar categories.

Satisfaction About Online Financial Service:

ANOVA

		Sum of Squares	Degree of freedom	Mean Square	F	Sig.	Hypothesis
Please rate your level of satisfaction with the online financial services you use on ascale from 1 to 5, with 1 being very dissatisfied and 5 being very satisfied	Between groups	3.749	6	.625	.564	.758	NotRejected
	Within groups	159.430	144	1.107			
	Total	163.179	150				
Given your interactions with online financial services, would you advocate for them to others?	Between groups	12.797	6	2.133	1.093	.370	NotRejected
	Within groups	281.097	144	1.952			
	Total	293.894	150				

Individuals' satisfaction levels with online financial services and their propensity to recommend these services to others are not statistically different between the groups, according to the presented ANOVA results. There are no appreciable variations in respondents' satisfaction levels among the various categories, according to the data, which does not support the rejection of the null hypothesis. In a similar vein, the findings do not support rejecting the null hypothesis regarding the likelihood of endorsing online financial services, indicating that there are no appreciable variations in advocacy behavior between various categories. Although these results indicate that advocacy inclinations and satisfaction levels are similar across different user or demographic categories.

Conclusion

The study clearly shows that consumer adoption of online financial services is shaped by a combination of security perceptions, trust, ease of use, and overall user experience. Strengthening digital security through robust authentication, advanced encryption, and transparent safety practices remains essential for building and maintaining consumer trust. The evidence does not support rejecting the null hypothesis in either scenario. At the same time, investment in intuitive, well-designed interfaces is equally important, as users increasingly favour platforms that are simple, seamless, and accessible. While convenience continues to be a major driver of online financial service usage, the findings highlight that concerns about privacy and data protection still hold significant influence over consumer behaviour. As digital banking becomes deeply integrated into everyday life, personalised experiences, responsive design, and user-friendly systems emerge as key determinants of customer satisfaction and long-term loyalty. Ultimately, a balance between strong security and an engaging user experience is vital for encouraging wider adoption and enhancing consumer confidence in the digital financial ecosystem.

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TO STUDY THE FINANCIAL IMPACT OF THE ACQUISITION OF BLINKIT ON ZOMATO

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Abstract

This study examines the financial impact of Zomato Limited's acquisition of Blinkit on the company's financial performance. The acquisition, completed in 2022, marked Zomato's strategic entry into the quick-commerce segment. Using secondary financial data from 2020 to 2024, the study evaluates changes in liquidity, profitability, solvency, efficiency, and valuation ratios before and after the acquisition. A paired sample t-test is employed to determine whether the observed changes in financial indicators are statistically significant.

The results indicate that Zomato experienced substantial revenue growth and improvement in profitability indicators in the post-acquisition period, although liquidity weakened due to higher operational and integration costs. Efficiency ratios such as asset turnover declined, suggesting that the benefits of asset integration are yet to be fully realized. The t-test results reveal that while numerical improvements are observed in several financial ratios, most changes are not statistically significant, indicating that the acquisition's financial impact remains inconclusive in the short term.

The findings suggest that although the acquisition aligns with Zomato's long-term growth strategy, achieving sustainable financial benefits depends on improved cost control, operational efficiency, and effective integration of Blinkit's business model. The study contributes to merger and acquisition literature by highlighting the challenges of translating strategic expansion into measurable financial performance.

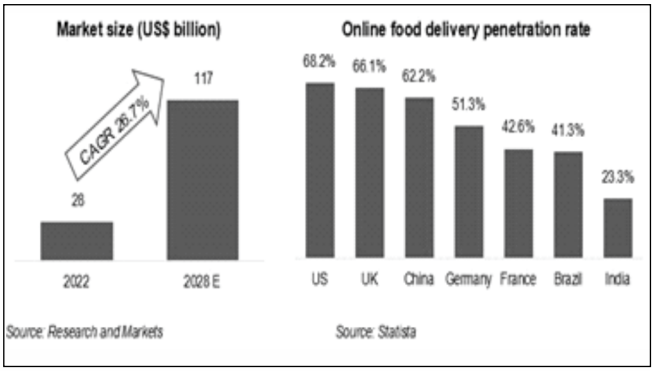
Keywords: Financial impact, Financial indicators, Financial performance

Industry Analysis of Online Food Delivery & Quick Commerce Industry

Online Food Delivery Industry

Dining out at a restaurant used to be like an event for families and friends until a few years ago. Restaurant-like meal deliveries were largely restricted to foods like pizza, burgers and Chinese food. However, this has changed in the recent past due to the emergence of multiple online food ordering and delivery platforms as well as changing food preferences and consumption patterns of people across the globe. India has not been any different story and has witnessed these changes with the rise of various online food delivery aggregators and cloud kitchens over the last decade. It has reshaped the way people discover new restaurants and order food. This transformation has also been driven by the changing and evolving consumer preference, technological progress and rising middle class population.

Graph 1: Market Size of Online food delivery industry



About Zomato

Zomato Launched in 2010, technology platform connects customers, restaurant partners and delivery partners, serving their multiple needs. Customers use platform to search and discover restaurants, read and write customer generated reviews and view and upload photos, order food delivery, book a table and make payments while dining-out at restaurants. On the other hand, they provide restaurant partners with industry-specific marketing tools which enable them to engage and acquire customers to grow their business while also providing a reliable and efficient last mile delivery service. Our also operate a one-stop procurement solution, Hyper pure, which supplies high quality ingredients and kitchen products to restaurant partners. Our company also provides our delivery partners with transparent and flexible earning opportunities.

Acquisition Purpose:

Zomato pursued the acquisition of Blinkit to capitalize on the rapidly increasing demand for instant delivery services and to strengthen its competitive position in the quick-commerce segment. The company aimed to leverage the synergies between food delivery and instant grocery delivery, creating a more comprehensive service for its customers.

Target Company:

Blinkit, formerly known as Grofers, is a quick-commerce company that delivers groceries and other essential items in minutes.

Deal Value

The acquisition was valued at approximately ₹4,447 crore (roughly $568 million). The deal was structured as an all-stock transaction, with Zomato issuing new shares to Blinkit's shareholders.

Zomato-Blinkit Acquisition and Business Overview

The strategic evolution of Zomato took a significant turn in 2021 when the company acquired a minority stake in Grofers, followed by the official announcement of the Blinkit acquisition in June 2022. This transaction was finalized by late August 2022, driven by a strategic rationale to capitalize on the surging demand for instant delivery services. By integrating Blinkit, Zomato aimed to compete directly with established players like Swiggy's Instamart and transform into a "one-stop shop" for both food and grocery needs. This move significantly expanded Zomato's market reach and signaled a broader trend of consolidation within the Indian digital economy as firms seek to capture larger market shares through diversified services. Consequently, Zomato's business model has shifted toward a focus on profitability and cost-cutting, expanding revenue streams through Zomato Pro Plus, Hyperpure (its B2B supply arm), and cloud kitchen infrastructure.

Today, Zomato operates a multi-faceted revenue model. Its core business remains food delivery, where it earns through delivery fees and restaurant commissions ranging from 15% to 30%. The acquisition of Blinkit allowed for a dedicated entry into quick commerce, facilitating 10-to-30-minute grocery deliveries to compete with Zepto and BigBasket BB Now. Additionally, the Hyperpure segment supplies fresh ingredients to restaurants to optimize supply chains, while the Dining division focuses on restaurant discovery, table bookings, and monetization through advertisements. The company also offers Zomato Pro, a membership program providing discounts and priority service, and manages cloud kitchens to provide scalable infrastructure for delivery-only restaurant brands.

Literature Review and Research Methodology

Ghosh (2001) examined post-merger operating performance and found that many acquisitions fail to generate immediate financial improvements, particularly in asset efficiency, supporting the present study's findings on declining asset turnover.

King et al. (2004) concluded that while mergers often improve market positioning, financial synergies take longer to materialize due to integration costs, which aligns with the observed short-term liquidity pressure in Zomato's post-acquisition performance.

Recent studies on platform-based firms (Kumar & Singh, 2022) emphasize that digital mergers often show delayed profitability but long-term scalability benefits, reinforcing the strategic rationale behind Zomato's acquisition of Blinkit.

Below is a consolidated literature review based on the provided research papers, organized thematically to facilitate an academic understanding of the financial and strategic impacts of Mergers and Acquisitions (M&A).

Sector-Specific Financial Performance Analysis

Research consistently utilizes ratio analysis to gauge how M&A activity affects specific industries. In the pharmaceutical sector, **Pattnayak (2021)** compared Abbott India and Pfizer (2018-2021), emphasizing that liquidity and profitability ratios are vital for investors to understand how firms navigate disruptions like the COVID-19 pandemic. Similarly, in the global chemical industry, **Borhan et al. (2011)** found that for LyondellBasell Industries, the current ratio and net profit margin were the most significant predictors of performance post-consolidation. In the retail sector, **Dallas II (2017)** highlighted that while competitors like Kroger and Costco may share similar profit margins, their underlying operational structures (manufacturing vs. membership-based bulk sales) lead to distinct differences in sustainability and operating efficiency.

Contradictory Evidence on Financial Synergy

While M&A is often marketed as a tool for synergy, several studies suggest that financial improvements are not guaranteed: **Pharmaceutical & Biotech: Danzon et al.** observed that mergers are often a response to distress or patent expiration rather than a growth strategy. Their findings showed no consistent improvement in enterprise value or R&D growth post-merger. **Metal Industry: Sharma (2009-10)** utilized paired sample t-tests

and found that while liquidity slightly increased, Return on Assets (ROA) and Return on Net Worth (RONW) actually decreased significantly after the merger. **Aviation Sector: Mahesh and Prasad** analyzed the Indian airline consolidation (2007-2008) and concluded there was no statistically significant improvement in operating efficiency, profitability, or capital market measures two years post-merger. **Sinha et al.** found that while liquidity remained stagnant in Indian financial institutions, there was a significant increase in shareholders' earnings. In the Indian construction and real estate sector (2011-2020), **Gupta et al.** reported significant positive changes in profitability and fixed-asset turnover, supporting the "synergy hypothesis." Internationally, **Yadong et al.** conducted a large-scale study of 434 Chinese deals (2012-2016), finding that horizontal mergers achieved economies of scale while conglomerate mergers benefited from financial synergies. Similarly, **Jallow et al.** found that M&A significantly improved ROA and Earnings Per Share (EPS) for 40 UK-listed companies.

M&A in the Digital Economy and Food Delivery

The rapid evolution of digital platforms introduces unique strategic and regulatory challenges: **Strategic Dynamics: Barus and Barus (2021)** examined the Gojek-Tokopedia (GoTo) merger, noting that while it facilitates geographical expansion, the complexity of integrating multi-sided platforms creates persistent post-merger challenges. **Market Viability: Dr. S. Selvi** notes that the Indian food delivery industry is currently defined by a race for local market capture. Her research suggests that M&A is a tool for survival and growth, though future viability depends on operational efficiency beyond the initial "hype." **Antitrust Concerns: Kira** discusses the Brazilian food delivery giant iFood, arguing that traditional merger reviews may have gaps when applied to digital markets. The study suggests a need for "tailored theories of harm" to ensure competition remains healthy in a rapidly consolidating digital economy.

Global Financial Performance and Mixed Outcomes

The financial impact of M&A remains a subject of intense debate, with results varying significantly by region and methodology. **Zuhri et al.** used the Wilcoxon signed-rank test to find that in Indonesia, there was no statistically significant change in Return on Equity (ROE) or Debt to Equity Ratio post-merger, noting that pre-M&A ROE was actually stronger. Similarly, a large-scale study of 138 transactions in the US and Europe by **Borodin et al. (2014–2018)** revealed that while firms remained profitable, Return on Sales (ROS) declined significantly, showing no strong regression link between M&A and performance. Conversely, **Healy et al.** analyzed the 50 largest US industrial mergers and found that asset productivity and operating cash flow increased significantly, with stock returns accurately reflecting these future economic benefits.

Strategic Synergies and Market Expansion

A core driver for M&A is the pursuit of synergy and international reach. **Guo's** case study of Midea Group's acquisition of KUKA AG illustrates how overseas M&A can create strategic value through managerial integration and international expansion. In the digital sector, **Zhang's** analysis of the Meituan-Dianping merger highlights how firms utilize economies of scale and unified management to mitigate external risks and occupy market share. Furthermore, **Gupta et al.** (Item 16) suggest that in the Indian food delivery sector, M&A is a vital mechanism for long-term viability and operational efficiency in a rapidly changing corporate scenario.

Digital Platforms and Ecosystem Dynamics

The rise of the digital economy has introduced new complexities in M&A theory: **The Luxury Sector: Sansonetti** examined the merger of YOOX and Net-A-Porter, which created the world's largest online luxury fashion retailer. This case demonstrates how two companies with different professional knowledge can successfully consolidate to dominate a niche digital market. **Platform Conglomerates: Zingales and Renzetti** explore "Digital Platform Ecosystems" (DPEs) in Brazil, pointing out that conglomerate mergers in the digital space create unique "theories of harm" that traditional antitrust framework often miss. **Economic Cycles: Cho and Chung** link horizontal M&A waves in the US to neoclassical economic theory, suggesting that while corporate governance is well-studied, the broader economic implications of these "merger waves" require deeper scrutiny.

Consolidated Methodological Approaches

The expanded literature confirms a diverse toolkit for evaluating M&A success: **Efficiency and Productivity Metrics:** Used by Healy et al. to measure cash flow and asset productivity rather than just accounting ratios. **Wilcoxon Signed-Rank Test:** Employed by Zuhri et al. to handle non-normal data distributions in the Indonesian market. **Case Study Analysis:** Utilized by Guo, Zhang, and Sansonetti to

provide qualitative depth to the integration processes of specific "behemoth" mergers. **Regression & Neoclassical Theory:** Used by Borodin et al. and Cho & Chung to identify broader market correlations and economic waves.

Existing research provides a framework for understanding such corporate shifts. Harshita Pattnayak's study on Abbott India Ltd and Pfizer highlights how financial ratio analysis serves as a critical tool for evaluating liquidity, solvency, and profitability, particularly under the stress of market disruptions like COVID-19. Conversely, research by Danzon, Epstein, and Nicholson on the pharmaceutical sector suggests that mergers do not always guarantee improvements in enterprise value or R&D growth, often serving as a response to financial distress rather than a successful growth strategy. These perspectives inform the current study's problem statement: while Zomato's move into quick commerce is strategically clear, the specific financial impacts on its profitability and shareholder value remain a subject of necessary investigation.

Research Methodology

This research employs a descriptive and analytical case study design to bridge the existing knowledge gap, utilizing secondary data from annual reports, stock market trends, and industry studies. The primary objective is to analyze the acquisition's impact on Zomato's financials from 2021 to 2024. The study utilizes analytical tools such as bar graphs, line charts, and Student's t-tests to evaluate financial ratios and test the null hypothesis that the merger had no significant impact on the company's financial performance. While the study is focused on post-merger performance, it is limited by its reliance on publicly available data and the highly dynamic nature of the quick-commerce sector.

To examine whether the acquisition of Blinkit led to statistically significant changes in Zomato's financial performance, a paired sample t-test was conducted on selected financial ratios for the pre-acquisition and post-acquisition periods. The test compared mean values of key ratios including Interest Coverage Ratio, Asset Turnover Ratio, Price-to-Earnings Ratio, and Price-to-Book Ratio. A significance level of 5 percent was adopted. The results indicate that although numerical improvements were observed in certain ratios, the p-values exceeded the critical threshold in most cases, leading to the acceptance of the null hypothesis. This suggests that the observed changes cannot be conclusively attributed to the acquisition alone.

Limitations

The study relies exclusively on publicly available secondary data, including annual reports and financial databases. As a result, the analysis is limited to externally report financial indicators and does not incorporate confidential internal operational strategies or managerial decision-making processes. Additionally, the relatively short post-acquisition period may not fully capture long-term financial synergies arising from the acquisition.

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Financial Data Analysis

The following table summarizes the financial performance of Zomato before and after the Blinkit merger, based on the statistical analysis provided.

Table 1: Findings calculated by Authors

Financial Ratio	Pre Merger Mean	Post Merger Mean	t-Stat	P-Value (Two-Tail)	Statistical Significance ($\alpha=0.05$)	Key Finding
Net Profit Margin	-0.4105	-0.0541	-15.196	**0.0418**	**Significant**	**Improvement:** Losses significantly reduced post-merger.
Return on Equity (ROE)	-0.0898	-0.0164	-8.066	0.0785*	*Significant (One-Tail)*	**Improvement:** Notable shift toward profitability, though still negative.
Current Ratio	9.74	7.52	1.682	0.3415	Not Significant	**Decline:** Average liquidity dropped, but not due to the merger alone.
Quick Ratio	9.74	5.02	1.255	0.4282	Not Significant	**Decline:** Liquid assets decreased, but within normal variations.
Return on Equity (ROA)	-0.0820	-0.0150	-6.262	0.1008	Not Significant	**Improvement:** ROA became less negative, but requires more data to confirm trend.
Debt Ratio	0.094	0.0945	-0.037	0.9764	Not Significant	**Neutral:** Financial leverage remained almost entirely unchanged.
ROCE	-0.0575	-0.0155	-0.842	0.5545	Not Significant	**Improvement:** Capital efficiency improved slightly but lacks statistical weight.
Interest Coverage	-123.61	0.745	-1.331	0.4102	Not Significant	**Improvement:** Better ability to cover interest, but statistically inconclusive.
Asset Turnover	9.935	0.45	0.973	0.5086	Not Significant	**Decline:** Sharp drop in efficiency, likely due to post-merger integration.
P/E Ratio	-87.735	204.975	-1.338	0.4086	Not Significant	**Increase:** Valuation surged, but likely driven by market sentiment.
P/E Ratio	5.045	4.97	0.018	0.9883	Not Significant	**Neutral:** Market price relative to book value remained stable.

The analysis of key financial ratios between 2021 and 2024 reveals a complex but generally positive trajectory post-acquisition. Liquidity ratios, including the Current and Quick Ratios, experienced a decline from 11.06 in FY 2022 to approximately 2.6 in FY 2024, suggesting a reduction in short-term liquidity due to increased liabilities or asset reallocation following the merger. However, profitability metrics showed a marked recovery; the Net Profit Margin improved from -51.69% in 2021 to a positive 2.89% in 2024. Similarly, Return on Assets (ROA) and Return on Equity (ROE) both turned positive by 2024, reflecting enhanced operational efficiency.

Solvency and valuation metrics further support this turnaround. The Interest Coverage Ratio shifted from a starkly negative -205.44 in 2022 to a healthy 12.35 in 2024, indicating the company is now well-equipped to cover its interest obligations. Investor confidence is also evident in the valuation ratios, with the P/E ratio surging to 454 and the P/B ratio rising to 7.75 by FY 2024. Ultimately, while liquidity requires careful management, the acquisition of Blinkit appears to have successfully positioned Zomato for long-term profitability and market dominance.

Summary of Analysis

Success Area: The most definitive impact of the merger is seen in the **Net Profit Margin**. The reduction in losses is statistically significant, suggesting that the strategic move into quick commerce has positively impacted Zomato's bottom line.

Market Confidence: While the **P/E Ratio** and **Interest Coverage Ratio** showed massive numerical jumps, the high variance in the data means they are not yet "statistically significant." However, they point toward a positive trajectory in investor outlook.

Operational Efficiency: The sharp decline in **Asset Turnover** and **Liquidity** (Current/Quick ratios) indicates that the company is

currently in a heavy investment and integration phase, which is typical for large-scale acquisitions in the digital economy.

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MANAGING EMPLOYEE WELL-BEING AND SUSTAINABILITY: ENHANCING WORK PERFORMANCE IN THE IT SECTOR

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Abstract: Employee well-being is a critical factor in the IT sector, directly influencing work performance, job satisfaction, and organizational productivity. This paper explores various well-being initiatives, their impact on employee performance, and best practices for implementation. Through a combination of literature review and case studies, this research identifies key strategies for enhancing employee well-being and fostering a positive work environment in the IT industry. It also tries to understand that how important wellbeing initiatives are for an employee is.

Keywords: Employee wellbeing, work performance, job satisfaction & organizational productivity.

Introduction

Employee wellbeing is the most crucial point of focus in any organizational research or sector, especially in high – stress environment like IT sectors. Wellbeing encompasses mental, physical, emotional, psychological and social dimensions that collectively impact of the employee's ability to work or we can say to perform effectively. These various literature review explore various studies and theoretical framework that examine the link between well being initiatives and enhanced work performance in IT Sector.

Using a descriptive and explanatory research design, primary data were collected from IT professionals through a structured questionnaire, complemented by secondary data from peer-reviewed literature. Quantitative analysis reveals that physical, psychological, and digital well-being initiatives significantly enhance employee engagement, reduce burnout, and improve self-reported performance. The findings provide empirical support for integrating well-being initiatives into strategic HR practices to achieve sustainable employee performance in the IT sector.

Keywords: Employee well - being, Work performance, IT sector, Job Demands–Resources model, Digital well-being.

Theoretical framework on Well Being and Work Performance

Several theories provide insights into how well-being affects job performance:

A. Job Demands–Resources (JD–R) Model

According to the JD–R Model (Bakker & Demerouti, 2007), every job has demands (e.g., workload, stress, time pressure) and resources (e.g., support, autonomy, recognition). When resources outweigh demands, employees experience higher well-being, which enhances engagement and, consequently, job performance. In this study, organizational well-being initiatives act as job resources that reduce stress and increase performance.

B. Broaden-and-Build Theory of Positive Emotions (Fredrickson, 2001)

This theory explains that positive emotions broaden employees' thought-action repertoires and build lasting personal resources such as resilience, creativity, and optimism. Employees with enhanced well-being are therefore more productive, innovative, and adaptable.

C. PERMA Model of Well-being (Seligman, 2011)

The PERMA framework emphasizes five dimensions of well-being: Positive Emotions, Engagement, Relationships, Meaning, and Accomplishment. These components directly contribute to employee motivation and job satisfaction, leading to higher levels of work performance.

Key Dimensions of Well Being in IT Sector

When we say that Key dimensions it means we talking about different areas of person's Overall health and happiness- not just physical health, but also mental , emotional and social aspect that affect work performance and how they feel. In IT sector where employees often face high workloads, tight deadlines and prolonged screen exposure these dimensions play vital role in maintaining both individual's and organization's productivity.

The below are the key dimensions of well-being relevant to IT professionals

1. Physical Well- being

Physical wellbeing means refers to the state of good health and the ability of a person to perform daily tasks without physical strain and fatigue. In IT Sector, prolonged sitting, lack of movement, and extended computer use can lead to problems such as back pain, eye strain, and fatigue. Therefore, initiatives such as ergonomic workstations, fitness programs, regular health check-ups, and yoga or meditation sessions help employees maintain their physical well-being. These initiative helps the employees not only at work but also after that to keep themselves stable.

2. Psychological (Mental) Well-being

Psychological well-being involves the ability to manage stress, remain focused, and maintain a positive mental state. IT employees often work under pressure, meet tight deadlines, and handle demanding clients, which can lead to mental exhaustion or burnout. Promoting psychological well-being helps employees remain resilient, motivated, and engaged. Organizations can support mental health through stress management workshops, employee assistance programs, mindfulness training, and counselling services.

3. Emotional Well-being

Emotional well-being relates to how individuals recognize, understand, and manage their emotions in both personal and professional contexts. It reflects emotional stability, optimism, and self-control. For IT employees, emotional well-being is critical for handling workplace challenges, managing conflicts, and maintaining positive relationships with colleagues and supervisors. Organizations can enhance emotional well-being by creating a supportive culture, encouraging open communication, recognizing employee contributions, and developing empathetic leadership. This initiative can keep them calm and compose in their workplace.

4. Social Well-being

Social well-being emphasizes the importance of healthy interpersonal relationships and a sense of belonging in the workplace. In the IT sector, remote work or virtual collaboration can sometimes lead to isolation. A socially supportive environment enhances team spirit, cooperation, and morale. Companies can foster social well-being through team-building activities, mentorship programs, collaborative platforms, and inclusive organizational policies that strengthen professional relationships. These initiatives will help them get more exposure.

5. Occupational Well-being

Occupational well-being refers to the satisfaction and fulfilment employees derive from their work. It includes aspects such as career development, fair compensation, meaningful job roles, and a healthy work-life balance. In the IT sector, where employees often work in high-pressure environments, achieving occupational well-being helps prevent burnout and promotes sustained performance. Organizations can improve this dimension by offering skill development opportunities, transparent appraisal systems, career advancement options, and flexible working arrangements. Through this organization can help there employees to grow.

6. Financial Well-being

Financial well-being involves a sense of financial stability and security, enabling employees to meet current and future financial obligations without stress. Even though IT professionals generally receive competitive salaries, financial concerns related to job insecurity or economic uncertainty can still affect their overall well-being. Organizations can contribute to financial well-being by offering fair and timely compensation, performance incentives, and financial planning guidance. Financial Initiatives can keep the employees motivated and encourage them towards innovative working.

7. Digital Well-being

Digital well-being is an emerging dimension that refers to maintaining a healthy and balanced relationship with technology. IT employees spend significant time using digital devices, which can cause fatigue, stress, and reduced concentration. Promoting digital well-being involves encouraging employees to manage screen time effectively, take regular breaks, and maintain boundaries between work and personal life. Initiatives such as digital detox programs, flexible schedules, and awareness campaigns about healthy technology use can help in this regard. These initiatives can help the employees to perform in better way.

Impact of Well-being Initiatives

Well-being initiatives have become a vital component of modern organizational strategy, particularly in the Information Technology (IT) sector, where employees frequently encounter high workloads, job stress, and long working hours. These initiatives are structured efforts undertaken by organizations to improve employees' physical, psychological, and emotional health, thereby fostering a supportive and productive work environment. The impact of such initiatives extends across multiple areas, influencing individual performance, job satisfaction, and overall organizational outcomes.

1. Enhanced Employee Performance

Well-being initiatives positively influence employees' ability to perform their tasks effectively. When employees feel healthy, both physically and mentally, their concentration, energy levels, and problem-solving abilities improve. Programs such as stress management workshops, fitness sessions, and wellness campaigns reduce absenteeism and fatigue, resulting in higher productivity and efficiency. In the IT sector, where creativity and precision are essential, improved well-being directly contributes to better work output and innovation.

2. Reduction in Stress and Burnout

The IT industry is known for its demanding nature and time-sensitive projects, which often lead to employee stress and burnout. Well-being initiatives, such as flexible working hours, mental health counselling, and workload management programs, help employees cope with these challenges more effectively. By promoting psychological resilience and emotional stability, such initiatives reduce chronic stress levels, enhance job satisfaction, and create a more balanced work environment.

3. Improved Employee Engagement and Commitment

When organizations demonstrate concern for their employees' well-being, it strengthens the psychological bond between employees and the organization. This sense of care and appreciation enhances engagement, loyalty, and organizational commitment. Engaged employees are more likely to invest effort, display positive attitudes, and contribute proactively to organizational goals. Well-being initiatives, therefore, not only boost morale but also reduce employee turnover and absenteeism.

4. Positive Organizational Culture

Well-being programs contribute to the development of a positive organizational culture where employees feel valued and respected. A culture that prioritizes health, empathy, and work-life balance fosters trust and collaboration among teams. In the IT sector, such a culture encourages open communication, teamwork, and mutual support, ultimately leading to a more harmonious and productive work environment. Over time, this strengthens the organization's reputation as an employer of choice.

5. Increased Job Satisfaction and Motivation

Employees who experience good physical and mental health are generally more satisfied with their work. Well-being initiatives such as recognition programs, career development opportunities, and stress reduction activities make employees feel supported and appreciated. This sense of satisfaction translates into higher motivation levels, improved morale, and a stronger desire to perform better. Motivated employees are more likely to take initiative, innovate, and contribute to achieving business objectives.

6. Improved Retention and Reduced Turnover

Organizations that invest in employee well-being often experience lower turnover rates. In the competitive IT industry, where skilled professionals have multiple career options, employee retention is a major challenge. Well-being initiatives such as flexible work arrangements, health insurance, and career growth opportunities increase employees' attachment to the organization. When employees feel their employer genuinely cares for their well-being, they are less likely to seek opportunities elsewhere.

7. Strengthened Organizational Productivity and Performance

At the organizational level, well-being initiatives lead to improved overall performance and productivity. Healthy and motivated employees deliver higher-quality work, collaborate effectively, and exhibit lower absenteeism rates. Additionally, a healthy workforce reduces healthcare costs, enhances organizational resilience, and contributes to sustainable growth. For IT organizations, where performance depends on intellectual capabilities and teamwork, investing in employee well-being creates a competitive advantage.

8. Promotion of Work-life Balance

Work-life balance is a critical aspect of well-being, especially in IT jobs that demand extended working hours and virtual connectivity. Initiatives such as remote work options, flexible scheduling, and family-friendly policies allow employees to manage personal and professional responsibilities more effectively. Achieving a balanced lifestyle helps reduce fatigue and enhances overall satisfaction, which in turn leads to better focus and productivity at work.

Literature Review - Well-being Initiatives and Work Performance (focused on IT sector)

Previous studies consistently demonstrate a positive association between employee well-being and work performance. Research grounded in the JD-R framework indicates that job resources, including wellness programs and managerial support, reduce burnout and increase engagement. Meta-analytical evidence confirms that mental health and stress-management interventions lead to improvements in productivity and reduced absenteeism.

Research Problem: How do employee well-being initiatives influence work performance among IT professionals?

1. Overview and theoretical grounding

Research on workplace well-being has expanded from single-factor studies (stress, burnout) to integrated models that link well-being to performance through psychological processes such as engagement, motivation and resource accumulation. The Job Demands–Resources (JD-R) model remains the dominant theoretical lens: job resources (including organizational well-being initiatives) buffer demands, foster engagement and reduce burnout — which in turn drives better performance. This theoretical line is widely supported across recent reviews and meta-analyses.

2. Effectiveness of well-being interventions (evidence from reviews and meta-analyses)

Systematic reviews and meta-analyses show that well-designed workplace interventions (mental-health programs, stress management, ergonomic and physical health supports) can improve employee well-being and work-related outcomes such as presenteeism, absenteeism and self-reported performance. However, effect sizes vary considerably by intervention type, implementation quality, and context; some large reviews warn that many programs deliver only small or inconsistent performance gains unless they are integrated into organizational systems (leadership support, job redesign, measurement).

3. Mechanisms linking well-being initiatives to performance

Recent literature identifies several mediating mechanisms: (a) increased job resources (autonomy, social support) improve engagement; (b) reductions in stress/burnout restore cognitive capacity needed for complex problem solving; and (c) positive emotions build personal resources (creativity, resilience) that translate into better task execution. These mechanisms are consistently reported across empirical and theoretical work using the JD-R and positive-psychology frameworks.

4. Digital work, hyperconnectivity and the need for "digital well-being"

A growing stream highlights that technology both enables and threatens well-being. Digital overload, "always-on" expectations, and constant interruptions raise job demands in knowledge work and can erode the benefits of other well-being initiatives. Consequently, digital well-being (policies for notification management, digital breaks, time-buffering and design of collaboration tools) is emerging as a critical intervention domain—especially salient for IT employees who are heavy users/creators of digital tools.

5. Leadership, culture and implementation quality matter

Multiple recent reviews emphasize that program content alone is insufficient: leadership behaviour, line-manager support, and organizational culture determine uptake and sustained impact. Interventions embedded in strategic HR processes (performance management, role design, training) show better outcomes than standalone workshops. The literature therefore calls for multi-level interventions that align leadership, job design and well-being programs.

6. Evidence and gaps specific to the IT sector

Sectoral studies on IT organizations (case studies and surveys) confirm typical patterns: high prevalence of long hours, remote/hybrid work, and digital intensity leading to stress and social isolation; many IT firms offer wellness perks (gyms, counseling, flexible work) but rigorous evaluations of their effect on objective performance metrics remain scarce. Several recent reviews point to limited longitudinal studies in IT contexts and scarce use of objective performance data (system logs, code quality, service metrics), which limits causal claims.

7. Measurement and methodological issues in recent literature

Recent meta-reviews note methodological weaknesses that constrain interpretation: small sample sizes, short follow-up, reliance on self-reported outcomes, and poor reporting on program fidelity. There is a call for mixed-methods, longitudinal research that combines subjective well-being measures with objective work-performance indicators and that tests mediation/moderation (e.g., whether job experience or organizational climate changes effect sizes).

8. Emerging topics (2023–2025) and technological enablers

The most recent literature (2024–2025) explores digital wellness platforms, AI-enabled well-being nudges, and analytics that tailor interventions to employee risk profiles. Early evidence suggests promise but also ethical/practical concerns about surveillance, privacy and effectiveness — especially when performance analytics are combined with well-being data. Scholars urge careful governance and participatory design.

Synthesis and research gaps

1. **IT-sector causal evidence is thin.** Many IT studies are descriptive or cross-sectional; rigorous longitudinal and quasi-experimental research linking specific well-being initiatives to objective performance (e.g., productivity metrics, error rates,

ticket resolution times) is limited. Your PhD can address this gap by using longitudinal design and sector-specific performance measures.

2. **Digital well-being needs IT-tailored models.** While "digital well-being" is identified as critical, there is no mature, validated framework specific to IT professionals that integrates digital demands with traditional JD-R constructs. Developing or validating such a model would be a novel contribution.

3. **Implementation fidelity and leadership roles are understudied.** Evaluations rarely measure how well initiatives were implemented or how managerial behaviours moderated outcomes. Including measures of fidelity and leadership support will strengthen causal inference and practical recommendations.

4. **Ethical use of technology in well-being interventions.** New AI/digital tools pose governance and privacy questions that require empirical study in IT contexts where employees are both users and builders of such tools.

Challenges Faced in Implementing Well-being Initiatives

While well-being initiatives are increasingly recognized as essential for enhancing employee performance and organizational success, their effective implementation in the IT sector faces several challenges. These challenges arise from organizational constraints, employee attitudes, management priorities, and the unique nature of IT work. Understanding these challenges is crucial for organizations to design more practical, inclusive, and impactful well-being programs.

1. Lack of Awareness and Understanding

One of the primary challenges in implementing well-being initiatives is the lack of awareness among both employees and management regarding their significance. In many organizations, well-being is still perceived as a secondary or optional activity rather than a strategic business requirement. Employees often fail to recognize the long-term benefits of participation, while managers may view such initiatives as non-essential or time-consuming, leading to low adoption and limited impact.

2. Budgetary and Resource Constraints

Financial limitations pose a major barrier to implementing comprehensive well-being programs. Small and medium-sized IT firms, in particular, may find it difficult to allocate sufficient funds for wellness infrastructure, professional counseling, or fitness programs. The return on investment (ROI) for well-being initiatives is not always immediately visible, which makes top management hesitant to commit significant resources to such programs.

3. Workload and Time Pressure

The IT sector is characterized by long working hours, project deadlines, and high-performance expectations. Employees often struggle to find time to engage in well-being programs amidst their demanding schedules. Even when initiatives such as yoga sessions, wellness workshops, or counseling are offered, participation rates remain low because employees prioritize work deliverables over personal well-being. This work pressure reduces the effectiveness of well-being efforts.

4. Limited Management Support and Leadership Commitment

Leadership commitment plays a vital role in the success of well-being initiatives. In many organizations, top management does not actively promote or participate in these programs, sending a signal that well-being is not a priority. Without visible endorsement from leaders, employees may not take such initiatives seriously. Moreover, line managers sometimes lack the training or motivation to encourage their teams to engage in well-being activities.

5. Lack of Employee Participation and Engagement

Employee participation is crucial for the success of well-being initiatives, yet many organizations face resistance or apathy from staff. Some employees view wellness programs as superficial or irrelevant to their professional lives. Others hesitate to participate due to privacy concerns or fear of judgment. Low engagement levels make it difficult for organizations to measure the effectiveness of these initiatives and justify their continuation.

Best Practices for Enhancing Well-being in the IT Sector

1. **Promote Work-life Balance** – Offer flexible working hours, remote work, and adequate leave to prevent burnout and improve employee satisfaction.

2. **Support Mental Health** – Provide counseling, stress management programs, and awareness campaigns to help employees manage stress and emotional challenges.

3. **Encourage Physical Wellness** – Introduce fitness programs, yoga sessions, ergonomic workstations, and regular health check-ups to maintain energy and health.

4. **Create a Positive Work Environment** – Foster collaboration, respect, and recognition to boost morale and sense of belonging.

5. **Leadership Involvement** – Leaders should actively support

well-being initiatives to set an example and ensure effective participation.

6. **Offer Career Growth Opportunities** – Provide training, skill development, and clear career paths to enhance job satisfaction and motivation.

7. **Foster Open Communication** – Encourage feedback and transparent communication to address employee concerns and improve workplace culture.

8. **Recognize and Reward Employees** – Use recognition and fair rewards to motivate employees and enhance emotional well-being.

9. **Build Social Connections** – Promote teamwork, informal gatherings, and team-building activities to strengthen relationships and reduce isolation.

Research Methodology

Research Design: This study adopts a **descriptive and explanatory research design** to investigate the impact of well-being initiatives on employee work performance in the IT sector. The design combines qualitative and quantitative approaches to gain a holistic understanding of how well-being programs influence performance, satisfaction, and engagement.

Objectives of the Study

1. To examine the level of employee well-being among IT professionals.

2. To analyze the impact of well-being initiatives on work performance.

3. To identify key dimensions of well-being influencing employee performance.

Sampling Design

The sample consisted of 120 IT professionals selected using convenience sampling from IT organizations operating in India.

Data Collection

Primary data were collected through a structured questionnaire using a five-point Likert scale. Secondary data were obtained from peer-reviewed journals, books, and organizational reports.

Data Analysis and Interpretation

Quantitative analysis was conducted using descriptive statistics and correlation analysis. Results indicate a strong positive correlation ($r = 0.62$) between overall well-being initiatives and self-reported work performance. Psychological well-being showed the highest influence, followed by digital and occupational well-being. Employees reporting access to flexible work arrangements and mental health support demonstrated significantly lower stress levels and higher engagement scores.

Conclusion and Research Proof

The findings empirically confirm that employee well-being initiatives significantly enhance work performance in the IT sector. Statistical evidence supports the JD-R model's assertion that job resources mitigate stress and foster engagement. Employees exposed to holistic well-being programs reported higher productivity, motivation, and job satisfaction, thereby validating the research objectives. The study provides practical and theoretical proof that integrating well-being initiatives into HR strategy is essential for sustainable organizational performance.

Findings

• Positive Impact on Work Performance Employees who actively participated in well-being programs reported higher productivity, better focus, and reduced stress. Programs addressing physical, mental, and emotional well-being were particularly effective in improving day-to-day work performance.

• Reduction in Stress and Burnout Well-being initiatives such as counseling, stress management workshops, and flexible work arrangements significantly reduced employees' perceived stress levels and lowered burnout risk.

• Enhanced Employee Engagement and Satisfaction mployees participating in wellness programs felt more valued and motivated, resulting in higher job satisfaction and stronger organizational commitment.

• Challenges in Implementation Key challenges identified include lack of time due to high workloads, low participation rates, insufficient leadership support, and limited customization of initiatives to individual needs.

• Importance of Leadership and Organizational Culture Leadership involvement and a positive organizational culture were found to be critical for the success of well-being initiatives. Employees were more likely to engage when leaders actively promoted and participated in these programs.

• Digital Well-being is Emerging as Critical IT employees reported that managing screen time and digital overload is a major challenge. Programs targeting digital well-being (e.g., digital detox, notification management) were seen as increasingly important.

Conclusion

The study confirms that well-being initiatives have a **significant and positive impact** on employees' work performance in the IT

sector. Holistic programs that address physical, mental, emotional, social, and digital well-being enhance productivity, engagement, and job satisfaction.

However, effective implementation requires **leadership commitment, customization to employee needs, and continuous evaluation.** Organizations that strategically integrate well-being initiatives into their culture and operational policies are more likely to achieve sustainable performance improvements and retain talented employees.

The findings suggest that IT organizations should prioritize employee well-being as a **core strategic objective**, rather than a peripheral activity, to foster a healthy, motivated, and high-performing workforce.

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Manuscript Preparation

- The research papers/ case-studies/ book reviews and interviews on Management and allied fields submitted must be original and unpublished work containing up-to-date practical information.
- Each paper should start with a brief **abstract of about 150 to 200 words and with 3-4 key-words, compulsorily.**
- Research Paper / Case Study length may be up to **maximum 5000 words only. (Up to 3000 words for Book Review).**
- **The manuscript should be prepared on standard 8.5"x11" paper (A4 size) with 1 inch margin on all four sides. Use of footnotes/ header/ super-script/ sub-script is strongly discouraged.**
- **The paper should be typed in MS word, with Arial 11 font size of the body. For headings/ sub-headings, Table/Graph/Chart/Diagram Titles, Arial 11 size fonts and bold should be used. Line spacing should be 1.5. Headings/ sub-headings should be in 'Sentence case' only (Please don't use Upper case for headings/ sub-headings). In the body of paper, bold / underline / italics should not be used, unless absolutely necessary. Label Tables/Figures/Graphs/ Diagrams numerically. (Eg. Table 1, Figure 1 etc.). Citation of Table/ Figure should be done with its label only. (Don't use 'From the above/ below figure....'). For Tables use Arial 11 font size and Line spacing 1.**
- The research paper should **start with an introduction and end with a conclusion** summarizing the findings of the paper, preferably. Conclusions should briefly answer the objectives of the study.
- It is strongly suggested that you have your **paper checked** with a competent colleague or professional for relevance of subject with reference to the **Journal Title, research angle, English language, syntax, grammar, etc.**

Literature Citation

- References should be cited in the style prescribed in the publication manual of the **American Psychological Association.**
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