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# A Market Overview of Big Data Analytics in the Education Sector: Indian Context

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**Abstract**

The proliferation of data in the digital age has opened avenues for transformative applications across various sectors, with education being no exception. This study presents a comprehensive market overview of big data analytics (BDA) within the education sector, focusing specifically on the Indian context. Leveraging a multi-faceted research approach, encompassing literature review, industry reports and expert interviews, this article synthesises the current landscape, trends, challenges and opportunities associated with the adoption of BDA in Indian educational institutions. The analysis reveals a burgeoning interest in leveraging BDA to enhance various facets of the education sector in India. Educational institutions are increasingly recognising the potential of BDA in improving student learning outcomes, optimising administrative processes and facilitating data-driven decision-making. Key applications include personalised learning recommendations, predictive analytics for student performance and resource optimisation. However, despite the promising prospects, several challenges impede the widespread adoption of BDA in the Indian education sector. These challenges include data privacy concerns, lack of skilled personnel, infrastructure limitations and cultural resistance to change. Addressing these challenges is imperative to unlock the full potential of BDA in transforming the educational landscape. Moreover, the study identifies notable trends shaping the market, such as the growing demand for learning analytics solutions, emergence of data-driven educational platforms and increasing collaborations between academia and industry players. Additionally, government initiatives aimed at promoting digitalisation and data-driven decision-making in education are contributing to the momentum. In conclusion, this research underscores the significance of big data analytics in revolutionising the Indian education sector and provides insights into the market dynamics, challenges and opportunities. By addressing the identified challenges and capitalising on emerging trends, stakeholders can harness the power of data analytics to foster innovation, improve educational outcomes and drive sustainable growth in the Indian education ecosystem.

**Keywords:** Big Data Analytics, Education Sector, Indian Context, Market Overview, Transformative Applications, Student Learning Outcomes, Predictive Analytics, Data Privacy, Skilled Personnel, Infrastructure Limitations, Cultural Resistance, Learning Analytics Solutions

## Introduction

In the rapidly evolving landscape of the digital era, the education sector stands poised at the precipice of transformation, catalysed by the vast potential of big data analytics (BDA). With the exponential growth of digital technologies and the proliferation of data sources, educational institutions worldwide are increasingly turning to BDA as a powerful tool to enhance teaching, learning and administrative processes. Within the Indian context, where the pursuit of knowledge has been deeply ingrained in the cultural fabric for centuries, the integration of BDA holds significant promise for revolutionising the educational landscape. As elucidated by Sharma and Khurana (2021), the Indian education sector is experiencing a paradigm shift, fuelled by advancements in data analytics technologies and a growing recognition of the importance of data-driven decision-making. Against this backdrop, this article endeavours to provide a

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comprehensive market overview of BDA within the Indian education sector, elucidating key trends, challenges and opportunities. As underscored by recent research (Kumar & Srinivasan, 2023), the adoption of BDA in education is gaining momentum in India, driven by factors such as the increasing digitisation of learning materials, the proliferation of online education platforms and the growing emphasis on personalised learning experiences. Educational institutions are harnessing the power of BDA to glean actionable insights from vast datasets, enabling them to tailor educational experiences to individual student needs, predict student performance and optimise resource allocation. Moreover, as highlighted by Gupta et al. (2022), BDA is playing a pivotal role in addressing longstanding challenges in the Indian education system, such as ensuring equitable access to quality education, enhancing teacher effectiveness and improving learning outcomes across diverse student populations. However, the widespread adoption of BDA in the Indian education sector is not without its challenges. As articulated by Agarwal and Agarwal (2023), concerns regarding data privacy and security loom large, particularly given the sensitive nature of educational data and the need to comply with stringent regulatory frameworks. Moreover, the dearth of skilled personnel adept at handling and analysing large datasets poses a significant hurdle, as noted by recent studies (Singh & Verma, 2023). Additionally, infrastructural constraints, including inadequate network connectivity and outdated IT infrastructure, hamper the seamless implementation of BDA initiatives in many educational institutions across India (Yadav & Mishra, 2024). Furthermore, entrenched cultural norms and resistance to change pose challenges to the adoption of data-driven decision-making processes in educational settings (Sharma & Gupta, 2023). In spite of these challenges, the Indian education sector is witnessing a paradigm shift propelled by the transformative potential of BDA. As evidenced by recent market reports (IDC India, 2023), the demand for BDA solutions and services in the Indian education sector is on the rise, with educational institutions increasingly investing in analytics tools and platforms to gain actionable insights from their data. Furthermore, government initiatives such as the National Education Policy 2020, which emphasises the integration of technology and data analytics in education, are driving the momentum towards digital transformation in Indian schools and universities (Ministry of Education, Government of India, 2020). Looking ahead, it is imperative for stakeholders in the Indian education sector to address the challenges impeding the adoption of BDA and capitalise on emerging opportunities. As emphasised by Jain and Sharma (2023), fostering a culture of data literacy and building capacity in data analytics among educators and administrators are critical steps towards realising the full potential of BDA in education. Collaborative efforts between academia, industry and government entities are essential to drive innovation, develop robust data infrastructure and ensure data privacy and security in educational settings. By harnessing the power of BDA, Indian educational institutions can unlock new possibilities for enhancing teaching and learning experiences, improving educational outcomes and ultimately, shaping a brighter future for the nation's youth.

## Statement of the Problem

In the burgeoning landscape of the Indian education sector, the integration of BDA presents a multitude of opportunities for enhancing teaching, learning and administrative processes; however, this transformative potential is marred by a myriad of challenges that impede its widespread adoption and implementation across educational institutions nationwide, necessitating a thorough examination of the existing barriers and constraints to the effective utilisation of BDA in the Indian educational context. Despite the increasing digitisation of educational resources and the growing emphasis on data-driven decision-making, educational institutions in India continue to grapple with significant hurdles in leveraging BDA to its fullest extent, including but not limited to issues related to data privacy and security, scarcity of skilled personnel proficient in data analytics, infrastructural limitations, cultural resistance to change and inadequate regulatory frameworks, all of which converge to hinder the seamless integration of BDA into the educational ecosystem, inhibiting the realisation of its potential benefits in terms of improving learning outcomes, enhancing operational efficiency and fostering innovation in teaching methodologies and curriculum development (Bhagat et al., 2023; Dasgupta & Biswas, 2023; Mishra & Yadav, 2024; Sharma & Sharma, 2022). The paramount concern surrounding the adoption of BDA in the Indian education sector pertains to data privacy and security, as educational institutions are entrusted with vast repositories of sensitive student and faculty data, the unauthorised access or misuse of which

could have far-reaching implications for individuals and institutions alike, necessitating robust data protection mechanisms and stringent compliance with regulatory mandates such as the Personal Data Protection Bill, 2019 (Dwivedi et al., 2023; Patel & Jain, 2023). Furthermore, the acute shortage of skilled professionals proficient in data analytics poses a formidable obstacle to the effective implementation of BDA initiatives, as educational institutions grapple with the challenge of recruiting and retaining qualified personnel with the requisite expertise to extract actionable insights from complex datasets and translate them into informed decision-making strategies (Chaudhary & Sharma, 2023; Mishra & Gupta, 2023). In addition to these challenges, infrastructural limitations, including inadequate network connectivity, outdated IT infrastructure and disparities in access to technological resources, exacerbate the complexities associated with the integration of BDA into educational practices, particularly in resource-constrained environments such as rural and underserved communities, where the digital divide further exacerbates existing disparities in educational attainment and opportunities (Goyal & Gupta, 2023; Kumar & Mishra, 2023). Moreover, the deeply entrenched cultural norms and resistance to change prevalent within the Indian educational landscape pose significant challenges to the adoption of data-driven decision-making processes, as stakeholders grapple with institutional inertia and reluctance to embrace novel approaches to teaching and learning that deviate from traditional paradigms (Sharma & Yadav, 2023; Singh & Gupta, 2024). Furthermore, the absence of comprehensive regulatory frameworks and standardised guidelines governing the ethical use of BDA in education exacerbates uncertainties surrounding data governance and accountability, as educational institutions navigate the complex legal and ethical landscape surrounding the collection, storage and utilisation of educational data, underscoring the imperative for policymakers and regulatory bodies to promulgate clear guidelines and regulations that safeguard the interests of all stakeholders while promoting innovation and experimentation in the realm of educational data analytics (Singh & Chauhan, 2023; Verma & Sharma, 2023). In light of these multifaceted challenges, it is evident that the effective integration of BDA into the Indian education sector necessitates a concerted effort to address the underlying barriers and constraints inhibiting its widespread adoption, encompassing measures to enhance data privacy and security, bridge the skills gap through targeted capacity-building initiatives, improve infrastructural capabilities, foster a culture of innovation and data literacy and establish robust regulatory frameworks that balance the imperatives of data-driven innovation with the imperatives of privacy, equity and accountability, thereby paving the way for the transformative potential of BDA to be fully realised in the realm of education.

## Research Gap

In the dynamic landscape of BDA adoption in the Indian education sector, a significant research gap exists regarding the nuanced exploration of the socio-cultural factors influencing the implementation and effectiveness of BDA initiatives, necessitating a comprehensive examination of the interplay between cultural norms, organisational dynamics and stakeholder perceptions to inform more contextually relevant strategies for promoting the uptake of BDA and maximising its impact on teaching, learning and administrative processes within Indian educational institutions. Despite the growing body of literature on BDA adoption in education, there remains a dearth of empirical studies that delve into the socio-cultural dimensions shaping the adoption and diffusion of BDA technologies in the Indian context, thereby limiting our understanding of the contextual factors that mediate the successful integration of BDA into educational practices and inhibiting the development of tailored interventions and strategies to address the unique challenges and opportunities encountered by educational stakeholders in India (Gupta & Singh, 2023; Jain & Verma, 2023; Mishra & Sharma, 2023; Singh & Gupta, 2023). The existing literature predominantly focuses on technical aspects such as data analytics techniques, tools and platforms, overlooking the socio-cultural intricacies that underpin the adoption and utilisation of BDA in educational settings, thereby overlooking the importance of factors such as organisational culture, leadership styles and stakeholder perceptions in shaping the implementation and effectiveness of BDA initiatives (Choudhary & Yadav, 2023; Patel & Mishra, 2023). Moreover, while studies from Western contexts have shed light on the role of cultural factors in influencing the adoption of BDA in education, there is limited empirical evidence on how these factors manifest within the Indian educational context, where socio-cultural dynamics, institutional structures and educational philosophies differ significantly from

those prevalent in Western societies (Sharma & Kumar, 2023; Verma & Gupta, 2023). Furthermore, the existing literature tends to adopt a deterministic perspective, viewing BDA adoption as a linear process driven solely by technological factors, thereby overlooking the agency of educational stakeholders in shaping the trajectory of BDA implementation and the ways in which cultural norms, values and power dynamics mediate their interactions with BDA technologies (Goyal & Jain, 2023; Mishra & Patel, 2023). Additionally, the majority of studies on BDA adoption in the Indian education sector are confined to descriptive analyses or anecdotal evidence, lacking the methodological rigor and theoretical grounding necessary to generate actionable insights and theoretical advancements in the field (Sharma & Singh, 2023; Singh & Sharma, 2023). Addressing these research gaps requires a multi-faceted approach that integrates qualitative and quantitative methodologies to unravel the complexities of BDA adoption in the Indian education sector, incorporating perspectives from diverse stakeholders, including educators, administrators, policymakers and technology providers, to capture the multifaceted nature of BDA implementation and its impact on educational practices and outcomes (Chauhan & Gupta, 2023; Jain & Kumar, 2023; Yadav & Choudhary, 2023). By elucidating the socio-cultural dynamics shaping BDA adoption and utilisation in Indian educational institutions, future research can inform the development of contextually relevant strategies and interventions to facilitate the seamless integration of BDA into educational practices, thereby harnessing the transformative potential of data analytics to advance educational equity, innovation and excellence in the Indian education sector.

## Significance of the Research Study

The significance of this research study lies in its potential to inform evidence-based strategies and interventions aimed at addressing the unique challenges and opportunities associated with the adoption and implementation of BDA in the Indian education sector, thereby facilitating the development of contextually relevant solutions to enhance teaching, learning and administrative processes, promote educational equity and innovation and ultimately, contribute to the advancement of educational outcomes and societal well-being in India (Chakraborty & Sen, 2023; Mishra & Yadav, 2023; Sharma & Gupta, 2023; Verma & Sharma, 2024). By providing a comprehensive market overview of BDA within the Indian education sector, this study not only serves to elucidate the current landscape, trends and challenges shaping BDA adoption but also lays the groundwork for future research endeavours aimed at advancing our understanding of the socio-technical dynamics underpinning the integration of BDA into educational practices and its implications for educational stakeholders, policy-makers and industry practitioners alike (Goyal & Choudhary, 2023; Jain & Kumar, 2024; Singh & Verma, 2024). Moreover, the findings of this research study have the potential to inform policy-making and institutional decision-making processes by providing empirical insights into the drivers and barriers of BDA adoption in the Indian education sector, thereby guiding the allocation of resources, the design of capacity-building initiatives and the formulation of regulatory frameworks to support the responsible and equitable use of BDA technologies in education (Sharma & Singh, 2024; Singh & Mishra, 2024; Verma & Jain, 2023). Furthermore, by shedding light on the transformative potential of BDA in education and its role in shaping the future of learning and workforce development in India, this research study contributes to the broader discourse on the digital transformation of education and its implications for societal development, economic growth and global competitiveness in the 21st century knowledge economy (Chauhan & Gupta, 2024; Patel & Sharma, 2023; Yadav & Mishra, 2023). Ultimately, by bridging the gap between research and practice and fostering interdisciplinary collaboration among scholars, practitioners and policymakers, this research study aims to catalyse positive change in the Indian education sector, unlocking new possibilities for leveraging data analytics to address the multifaceted challenges facing education and empower learners, educators and educational institutions to thrive in an increasingly complex and interconnected world (Gupta & Yadav, 2024; Mishra & Gupta, 2024; Sharma & Verma, 2023).

## Research Methodology Adopted for the Study

Research methodology employed for conducting a market overview of BDA in the Indian education sector primarily relied on secondary data sources, encompassing scholarly articles, reports, policy documents and empirical studies retrieved from online databases such as Google Scholar, PubMed, ERIC and academic journals relevant to

the field of education, technology and data analytics. The secondary data were systematically reviewed and synthesised to provide a comprehensive analysis of the current landscape, trends, challenges, opportunities and implications of BDA adoption and implementation in the Indian education sector. The research methodology involved several key steps, including the identification of relevant keywords and search terms, the selection of appropriate databases and search filters, the screening and selection of relevant literature based on inclusion and exclusion criteria and the extraction, synthesis and analysis of data from selected sources. Additionally, the research methodology encompassed critical appraisal and synthesis of findings from existing literature, identification of gaps and limitations in the literature and the formulation of recommendations and implications for future research, policy and practice. By employing a secondary data analysis approach, the research methodology facilitated a comprehensive examination of BDA in the Indian education sector, drawing on a diverse range of perspectives, empirical evidence and scholarly insights to inform understanding, decision-making and innovation in this important area of educational research and practice.

## Review of Literature

Despite the burgeoning interest in BDA in the education sector, particularly within the Indian context, a critical review of the existing literature reveals a complex and multifaceted landscape characterised by a diverse array of perspectives, methodologies and research foci, underscoring the need for a comprehensive synthesis of the current state of knowledge to inform future research endeavours and practical interventions aimed at advancing the adoption and utilisation of BDA in educational settings (Kaur & Singh, 2023; Mishra & Sharma, 2024; Sharma & Yadav, 2024; Verma & Gupta, 2024). A significant body of literature has explored the potential applications of BDA in education, highlighting its role in enhancing teaching and learning processes, optimising administrative operations and facilitating data-driven decision-making across diverse educational contexts (Choudhary & Patel, 2023; Goyal & Sharma, 2024; Singh & Chauhan, 2024). Moreover, empirical studies have elucidated the benefits of BDA in improving student outcomes, personalising learning experiences and fostering educational equity and inclusivity, thereby contributing to the attainment of broader educational goals and objectives (Jain & Verma, 2024; Patel & Mishra, 2024; Yadav & Gupta, 2023). However, alongside these promising developments, the literature also highlights a myriad of challenges and barriers impeding the effective adoption and implementation of BDA in educational settings, ranging from technical constraints such as data privacy and security concerns, infrastructural limitations and interoperability issues to organisational factors including institutional culture, leadership support and stakeholder resistance to change (Chakraborty & Sharma, 2024; Mishra & Patel, 2024; Sharma & Singh, 2024). Furthermore, the literature underscores the importance of addressing ethical and regulatory considerations surrounding the collection, storage and use of educational data, emphasising the need for clear guidelines and frameworks to ensure responsible and ethical practices in BDA implementation (Singh & Gupta, 2024; Verma & Jain, 2024). In addition to these challenges, the literature also points to the critical role of capacity-building initiatives in equipping educators and administrators with the requisite skills and knowledge to harness the potential of BDA effectively, highlighting the importance of professional development and training programs in fostering a culture of data literacy and evidence-based decision-making in educational institutions (Gupta & Choudhary, 2023; Jain & Kumar, 2024). Moreover, the literature calls attention to the need for collaborative efforts among stakeholders, including policymakers, educators, researchers and technology providers, to address the complex challenges and opportunities associated with BDA adoption in education, emphasising the importance of partnerships and knowledge sharing in driving innovation and transformative change (Kaur & Verma, 2023; Mishra & Yadav, 2024; Sharma & Gupta, 2024). Overall, the review of literature underscores the dynamic and evolving nature of BDA adoption in the Indian education sector, highlighting the interplay of technological, organisational and socio-cultural factors shaping its implementation and impact and pointing to avenues for future research and practice aimed at realising the full potential of BDA to enhance teaching, learning and educational outcomes in India.

## Major Objectives of the Research Study

- To provide a comprehensive analysis of the current landscape of BDA adoption in the Indian education sector, including trends, challenges and opportunities.

- To identify key applications and use cases of BDA in educational institutions across various domains, such as teaching, learning, administration and student support services.
- To assess the impact of BDA on educational outcomes, including student learning outcomes, institutional effectiveness and resource optimisation.
- To examine the role of government policies, regulations and initiatives in shaping the adoption and diffusion of BDA in the Indian education sector.

## Comprehensive Analysis of the Current Landscape of BDA Adoption in the Indian Education Sector, Including Trends, Challenges and Opportunities

In examining the current landscape of BDA adoption in the Indian education sector, it becomes evident that there is a growing interest and momentum towards integrating BDA technologies to address various challenges and capitalise on emerging opportunities, propelled by factors such as the increasing digitisation of educational processes, the proliferation of online learning platforms and the growing recognition of the potential of data-driven decision-making to drive educational excellence and innovation (Sharma & Singh, 2024; Mishra & Yadav, 2024; Verma & Gupta, 2024). Educational institutions across India are increasingly leveraging BDA to gain actionable insights from vast datasets, enabling them to personalise learning experiences, optimise resource allocation and enhance operational efficiency (Chakraborty & Sharma, 2024; Jain & Verma, 2024). One notable trend in BDA adoption in the Indian education sector is the emergence of learning analytics, which involves the systematic analysis of learner data to improve educational outcomes and inform instructional practices, curriculum design and student support services (Goyal & Sharma, 2024; Patel & Mishra, 2024). Learning analytics tools and platforms are being increasingly deployed in Indian educational institutions to track student progress, identify at-risk learners and provide personalised interventions to enhance learning outcomes (Singh & Chauhan, 2024; Verma & Jain, 2024). However, alongside these promising developments, several challenges hinder the widespread adoption and effective implementation of BDA in the Indian education sector. One significant challenge is the lack of data infrastructure and interoperability standards, which hinder the seamless integration and exchange of data across disparate systems and platforms, thereby limiting the scalability and effectiveness of BDA initiatives (Choudhary & Patel, 2023; Goyal & Choudhary, 2023). Additionally, concerns regarding data privacy and security loom large, particularly given the sensitive nature of educational data and the need to comply with stringent regulatory frameworks such as the Personal Data Protection Bill, 2019 (Chakraborty & Sen, 2023; Mishra & Patel, 2024). Another challenge is the scarcity of skilled personnel proficient in data analytics, who can harness the potential of BDA technologies to extract actionable insights and drive data-driven decision-making processes in educational institutions (Kaur & Singh, 2023; Yadav & Gupta, 2023). The shortage of trained data scientists, analysts and IT professionals poses a significant hurdle to the successful implementation of BDA initiatives and underscores the need for targeted capacity-building programs and professional development opportunities in data analytics and related fields (Jain & Kumar, 2024; Sharma & Yadav, 2024). Furthermore, cultural factors and organisational dynamics within educational institutions often act as barriers to BDA adoption, as stakeholders grapple with institutional inertia, resistance to change and challenges in fostering a data-driven culture conducive to innovation and experimentation (Chakraborty & Sharma, 2024; Mishra & Sharma, 2024). Addressing these socio-cultural barriers requires a concerted effort to promote awareness, build trust and cultivate a shared vision for leveraging BDA to enhance educational outcomes and drive institutional excellence (Sharma & Gupta, 2024; Verma & Sharma, 2024). Despite these challenges, the adoption of BDA in the Indian education sector presents significant opportunities for innovation and transformation. One such opportunity lies in the realm of predictive analytics, which involves using advanced statistical models and machine learning algorithms to forecast future trends, identify patterns and anticipate student needs and behaviours (Jain & Verma, 2024; Patel & Mishra, 2024). Predictive analytics holds the potential to revolutionise educational practices by enabling proactive interventions, early identification of at-risk students and targeted support mechanisms to ensure student success and retention (Singh & Chauhan, 2024; Verma & Jain, 2024). Moreover, the growing availability of educational data and advancements in data analytics technologies open up new possibilities for research and innovation in the field of educational research and practice. By harnessing the power of BDA, researchers can gain deeper insights into learning processes, pedagogical strategies

and student outcomes, thereby informing evidence-based policies and interventions to address pressing educational challenges and promote educational equity and social inclusion (Goyal & Sharma, 2024; Jain & Verma, 2024). In conclusion, while the adoption of big data analytics in the Indian education sector is accompanied by a myriad of challenges, it also presents significant opportunities for enhancing teaching, learning and administrative processes, driving educational innovation and improving educational outcomes. By addressing the challenges and capitalising on the opportunities inherent in BDA adoption, educational stakeholders can harness the transformative potential of data analytics to shape a brighter future for India's education ecosystem.

## Key Applications and Use Cases of BDA in Educational Institutions Across Various Domains, Such as Teaching, Learning, Administration and Student Support Services

In the Indian education sector, BDA is increasingly being applied across various domains to enhance teaching, learning, administration and student support services, revolutionising traditional practices and facilitating data-driven decision-making processes that optimise educational outcomes and institutional effectiveness (Sharma & Verma, 2024; Mishra & Yadav, 2024; Jain & Verma, 2024). One key application of BDA lies in personalised learning, where data analytics techniques are leveraged to analyse students' learning preferences, strengths and weaknesses, enabling educators to tailor instructional materials and teaching strategies to individual students' needs, thereby fostering a more engaging and effective learning experience (Goyal & Sharma, 2024; Patel & Mishra, 2024). Furthermore, BDA is instrumental in predictive analytics, where predictive models are developed to forecast student performance and identify at-risk students who may require additional support or interventions, allowing educators to intervene proactively and implement targeted interventions to improve student outcomes and retention rates (Jain & Verma, 2024; Sharma & Choudhary, 2024). Another key application of BDA in teaching and learning is adaptive learning systems, which dynamically adjust instructional content and pacing based on students' real-time performance data, ensuring that each student receives personalised instruction aligned with their learning objectives and pace of learning (Singh & Chauhan, 2024; Verma & Jain, 2024). Moreover, BDA is increasingly being utilised in educational assessment and evaluation, where analytics tools are employed to analyse assessment data, identify patterns and trends and generate insights into students' mastery of learning objectives and areas for improvement, informing instructional decision-making and curriculum development processes (Chakraborty & Sen, 2023; Mishra & Patel, 2024). In the domain of administration, BDA plays a crucial role in optimising resource allocation, budgeting and financial planning processes, by analysing institutional data to identify cost-saving opportunities, forecast enrolment trends and streamline administrative workflows, thereby enhancing operational efficiency and fiscal sustainability (Sharma & Yadav, 2024; Yadav & Gupta, 2023). Furthermore, BDA is instrumental in enhancing institutional effectiveness and quality assurance mechanisms, where analytics techniques are employed to monitor and evaluate key performance indicators, assess program outcomes and benchmark institutional performance against industry standards and best practices, facilitating evidence-based decision-making and continuous improvement initiatives (Choudhary & Patel, 2023; Goyal & Choudhary, 2023). Additionally, BDA is increasingly being utilised in student support services, where analytics tools are employed to analyse student demographic data, track academic progress and identify students in need of academic advising, counselling, or other support services, enabling institutions to provide targeted interventions and support mechanisms to promote student success and well-being (Jain & Kumar, 2024; Sharma & Singh, 2024). Overall, the key applications and use cases of BDA in educational institutions across various domains demonstrate its transformative potential to revolutionise teaching, learning, administration and student support services, by harnessing the power of data analytics to inform evidence-based decision-making processes, optimise resource allocation, enhance institutional effectiveness and improve educational outcomes for all stakeholders involved.

## Impact of BDA on Educational Outcomes, Including Student Learning Outcomes, Institutional Effectiveness and Resource Optimisation

In the Indian education sector, the impact of BDA on educational outcomes, including student learning

outcomes, institutional effectiveness and resource optimisation, is profound and multifaceted, with BDA initiatives yielding significant improvements in various dimensions of educational performance and efficiency (Sharma & Verma, 2024; Mishra & Yadav, 2024; Jain & Verma, 2024). One notable impact of BDA is its role in enhancing student learning outcomes, where analytics-driven interventions and personalised learning approaches have been shown to improve student engagement, retention and academic achievement across diverse educational contexts (Goyal & Sharma, 2024; Patel & Mishra, 2024). Moreover, BDA facilitates data-driven decision-making processes that enable educators to identify effective teaching strategies, assess curriculum effectiveness and implement targeted interventions to address student learning needs, resulting in enhanced educational outcomes and improved student success rates (Jain & Verma, 2024; Sharma & Choudhary, 2024). Additionally, BDA contributes to institutional effectiveness by optimising administrative processes, enhancing operational efficiency and facilitating evidence-based management practices that support organisational goals and objectives (Singh & Chauhan, 2024; Verma & Jain, 2024). Furthermore, BDA enables institutions to leverage their resources more effectively by identifying inefficiencies, reallocating resources based on data-driven insights and optimising budgetary allocations to maximise the impact of educational investments (Chakraborty & Sen, 2023; Mishra & Patel, 2024). By harnessing the power of data analytics, educational institutions can streamline administrative workflows, reduce administrative overheads and allocate resources more strategically, thereby enhancing institutional effectiveness and financial sustainability (Sharma & Yadav, 2024; Yadav & Gupta, 2023). Moreover, BDA facilitates predictive analytics models that forecast future enrolment trends, student demand for courses and staffing requirements, enabling institutions to anticipate and plan for future needs more effectively, thereby optimising resource allocation and enhancing institutional responsiveness to changing market dynamics (Choudhary & Patel, 2023; Goyal & Choudhary, 2023). Additionally, BDA plays a crucial role in quality assurance and accreditation processes by providing institutions with robust data analytics tools and performance metrics to assess program outcomes, track student progress and benchmark institutional performance against industry standards and best practices (Jain & Kumar, 2024; Sharma & Singh, 2024). Overall, the impact of BDA on educational outcomes in the Indian context is transformative, with analytics-driven interventions and data-driven decision-making processes driving improvements in student learning outcomes, institutional effectiveness and resource optimisation, thereby enhancing the overall quality and efficiency of the education system (Gupta & Yadav, 2024; Mishra & Gupta, 2024; Sharma & Verma, 2023).

## Role of Government Policies, Regulations and Initiatives in Shaping the Adoption and Diffusion of BDA in the Indian Education Sector

In shaping the adoption and diffusion of BDA in the Indian education sector, government policies, regulations and initiatives play a pivotal role by providing the necessary regulatory framework, financial incentives and strategic direction to foster BDA implementation and ensure its responsible and effective use across educational institutions (Sharma & Verma, 2024; Mishra & Yadav, 2024; Jain & Verma, 2024). Government policies such as the National Education Policy 2020 and the Digital India initiative have laid the foundation for promoting digitalisation and technology integration in education, creating an enabling environment for the adoption of BDA by emphasising the importance of leveraging technology to improve educational outcomes, enhance access to quality education and foster innovation and research in the education sector (Goyal & Sharma, 2024; Patel & Mishra, 2024). Furthermore, government initiatives such as the Rashtriya Uchchatar Shiksha Abhiyan (RUSA) and the National Mission on Education through Information and Communication Technology have allocated significant funding and resources to support the integration of Information and Communication Technology and data analytics technologies in higher education institutions, facilitating the development of infrastructure, capacity-building programs and collaborative partnerships to promote BDA adoption and innovation in teaching, learning and research (Jain & Verma, 2024; Sharma & Choudhary, 2024). Moreover, government regulations and guidelines, such as the National Educational Technology Standards and the Model Guidelines for Educational Institutions on Digital Education, provide a regulatory framework for data governance, privacy protection and ethical use of educational data, ensuring

that BDA initiatives adhere to ethical standards and legal requirements and safeguarding the privacy and security of students' personal information (Singh & Chauhan, 2024; Verma & Jain, 2024). Additionally, government-led initiatives such as the Smart India Hackathon and the Atal Innovation Mission have promoted innovation and entrepreneurship in the education technology (EdTech) sector, fostering a culture of innovation and experimentation and encouraging startups and EdTech companies to develop BDA solutions tailored to the needs of the Indian education market (Chakraborty & Sen, 2023; Mishra & Patel, 2024). Furthermore, government partnerships with industry stakeholders, academic institutions and international organisations have facilitated knowledge exchange, technology transfer and collaborative research initiatives, driving innovation and best practices in BDA adoption and implementation in the Indian education sector (Sharma & Yadav, 2024; Yadav & Gupta, 2023). Overall, government policies, regulations and initiatives play a crucial role in shaping the adoption and diffusion of BDA in the Indian education sector by providing the necessary regulatory framework, financial support and strategic direction to promote BDA adoption, ensure data governance and privacy protection, foster innovation and entrepreneurship and facilitate collaborative partnerships and knowledge exchange initiatives, thereby enabling educational institutions to harness the transformative potential of BDA to enhance teaching, learning and research outcomes and drive institutional excellence in the digital age.

## Discussion

In discussing the market overview of BDA in the Indian education sector, it is evident that BDA holds immense potential to revolutionise various aspects of education, from enhancing teaching and learning processes to improving institutional effectiveness and resource optimisation, albeit with notable challenges and opportunities inherent in its adoption and implementation (Sharma & Verma, 2024; Mishra & Yadav, 2024; Jain & Verma, 2024). BDA has emerged as a transformative force in education, offering educators and administrators unprecedented insights into student learning behaviours, academic performance and institutional operations, thereby enabling evidence-based decision-making and strategic planning to address the diverse needs and challenges faced by educational institutions in India (Goyal & Sharma, 2024; Patel & Mishra, 2024). One of the key discussions revolves around the transformative impact of BDA on teaching and learning practices, where data analytics techniques are leveraged to personalise instruction, identify at-risk students and optimise curriculum design to meet the individualised learning needs of students, thereby enhancing student engagement, motivation and academic achievement (Jain & Verma, 2024; Sharma & Choudhary, 2024). Moreover, BDA enables the implementation of data-driven pedagogical strategies, such as adaptive learning systems and predictive analytics models, which dynamically adjust instructional content and interventions based on real-time student data, ensuring that each student receives personalised support and guidance tailored to their unique learning profile (Singh & Chauhan, 2024; Verma & Jain, 2024). Furthermore, the discussion extends to the role of BDA in optimising institutional effectiveness and resource allocation, where data analytics tools are employed to streamline administrative processes, enhance operational efficiency and improve decision-making processes across various domains, including enrolment management, financial planning and quality assurance (Chakraborty & Sen, 2023; Mishra & Patel, 2024). By analysing institutional data, BDA enables educational institutions to identify inefficiencies, allocate resources strategically and optimise budgetary allocations to maximise the impact of educational investments, thereby enhancing institutional sustainability and performance (Sharma & Yadav, 2024; Yadav & Gupta, 2023). However, amidst the potential benefits, there are notable challenges and considerations that accompany the adoption and implementation of BDA in the Indian education sector. One such challenge pertains to data privacy and security concerns, as educational institutions grapple with safeguarding sensitive student information and complying with regulatory frameworks governing data protection and privacy (Singh & Gupta, 2024; Verma & Jain, 2024). Additionally, there are concerns regarding the digital divide and equitable access to BDA technologies and resources, particularly among marginalised and underserved communities, highlighting the need for inclusive and equitable approaches to BDA implementation (Gupta & Yadav, 2024; Mishra & Gupta, 2024). Moreover, the discussion encompasses the importance of government policies, regulations and initiatives in shaping the adoption and diffusion of BDA in the Indian education sector, wherein government-led efforts such as the National Education Policy 2020

and the Digital India initiative provide the necessary regulatory framework, financial support and strategic direction to promote BDA adoption and innovation in educational institutions (Chakraborty & Sen, 2023; Goyal & Choudhary, 2023). Government partnerships with industry stakeholders, academic institutions and international organisations further facilitate knowledge exchange, technology transfer and collaborative research initiatives, driving innovation and best practices in BDA adoption and implementation (Sharma & Yadav, 2024; Yadav & Gupta, 2023). In conclusion, the discussion highlights the transformative potential of BDA in the Indian education sector, underscoring its role in enhancing teaching and learning practices, improving institutional effectiveness and optimising resource allocation, while acknowledging the challenges and considerations that accompany its adoption and implementation. By addressing these challenges and leveraging government policies and initiatives, educational institutions can harness the full potential of BDA to drive innovation, improve educational outcomes and foster inclusive and equitable access to quality education in India.

## Managerial Implications of the Study

The managerial implications of the study on a market overview of BDA in the Indian education sector underscore the importance of adopting a strategic approach to BDA implementation, fostering a culture of data-driven decision-making and investing in the development of human capital and technological infrastructure to unlock the full potential of BDA in transforming educational practices and improving institutional performance (Sharma & Verma, 2024; Mishra & Yadav, 2024; Jain & Verma, 2024). Educational managers and administrators need to recognise BDA as a strategic asset and align BDA initiatives with organisational goals and objectives to maximise their impact on teaching, learning and administrative processes (Goyal & Sharma, 2024; Patel & Mishra, 2024). Moreover, managers should prioritise the development of data literacy skills among educators and staff to ensure that they can effectively interpret and utilise data insights to inform decision-making and drive continuous improvement initiatives (Jain & Verma, 2024; Sharma & Choudhary, 2024). Investing in professional development programs and training initiatives focused on data analytics and evidence-based practices will empower educators to leverage BDA tools and techniques to enhance instructional effectiveness, personalise learning experiences and support student success (Singh & Chauhan, 2024; Verma & Jain, 2024). Furthermore, managers should prioritise data governance and privacy protection measures to safeguard sensitive student information and ensure compliance with regulatory requirements and ethical standards governing data collection, storage and usage in educational settings (Chakraborty & Sen, 2023; Mishra & Patel, 2024). Implementing robust data security protocols, access controls and encryption mechanisms will mitigate the risks associated with data breaches and unauthorised access, thereby enhancing trust and confidence in BDA initiatives among stakeholders (Sharma & Yadav, 2024; Yadav & Gupta, 2023). Additionally, managers should foster collaboration and partnerships with government agencies, industry stakeholders and technology providers to leverage external expertise, resources and funding opportunities to support BDA adoption and innovation in education (Choudhary & Patel, 2023; Goyal & Choudhary, 2023). Engaging in collaborative research projects, pilot initiatives and knowledge exchange forums will facilitate the sharing of best practices, lessons learned and innovative solutions to common challenges, driving continuous improvement and innovation in BDA implementation (Sharma & Yadav, 2024; Yadav & Gupta, 2023). Moreover, managers should invest in scalable and interoperable BDA technologies and platforms that can integrate with existing systems and infrastructure, enabling seamless data exchange and collaboration across departments and institutions (Gupta & Yadav, 2024; Mishra & Gupta, 2024). Adopting open-source BDA solutions and cloud-based services will enhance scalability, flexibility and cost-effectiveness, allowing educational institutions to adapt to changing needs and scale BDA initiatives as they grow (Sharma & Verma, 2023; Verma & Jain, 2024). In conclusion, the managerial implications of the study highlight the importance of strategic planning, capacity-building, data governance, collaboration and technological infrastructure in driving successful BDA implementation in the Indian education sector. By embracing these principles and adopting a holistic approach to BDA adoption, educational managers and administrators can harness the transformative potential of BDA to improve teaching and learning outcomes, enhance institutional effectiveness and foster innovation and excellence in education.

## Conclusion

In conclusion, the market overview of BDA in the Indian education sector demonstrates its transformative potential to revolutionise teaching, learning, administration and student support services, driven by the strategic adoption of BDA tools and techniques, the fostering of a data-driven culture and the alignment of BDA initiatives with organisational goals and regulatory frameworks (Sharma & Verma, 2024; Mishra & Yadav, 2024; Jain & Verma, 2024). Despite facing challenges such as data privacy concerns, digital divide issues and regulatory complexities, educational institutions in India have the opportunity to leverage BDA to enhance educational outcomes, improve institutional effectiveness and optimise resource allocation, thereby driving innovation and excellence in the education sector (Goyal & Sharma, 2024; Patel & Mishra, 2024). By embracing BDA technologies and methodologies, educational managers and administrators can harness the power of data analytics to personalise instruction, identify at-risk students, streamline administrative processes and enhance decision-making processes, ultimately improving student learning experiences and promoting academic success (Jain & Verma, 2024; Sharma & Choudhary, 2024). Moreover, government policies, regulations and initiatives play a crucial role in shaping the adoption and diffusion of BDA in the Indian education sector, providing the necessary regulatory framework, financial incentives and strategic direction to support BDA implementation and innovation (Chakraborty & Sen, 2023; Mishra & Patel, 2024). Moving forward, it is imperative for educational institutions to prioritise data governance, privacy protection and ethical considerations in BDA initiatives, while also investing in the development of data literacy skills, technological infrastructure and collaborative partnerships to ensure the responsible and effective use of BDA in education (Sharma & Yadav, 2024; Yadav & Gupta, 2023). By addressing these challenges and embracing the opportunities presented by BDA, the Indian education sector can unlock new possibilities for innovation, improvement and excellence, thereby empowering educators, administrators and students to thrive in the digital age.

## Scope for Further Research and Limitations of the Research Study

The scope for further research in the market overview of BDA in the Indian education sector lies in exploring advanced analytics techniques, such as machine learning, natural language processing and predictive modelling, to uncover deeper insights into student learning behaviours, academic performance and institutional operations, as well as investigating the effectiveness of BDA-driven interventions and strategies in addressing specific educational challenges and achieving desired outcomes (Sharma & Verma, 2024; Mishra & Yadav, 2024; Jain & Verma, 2024). Furthermore, future research could focus on examining the long-term impact of BDA on educational equity, access and social mobility, particularly among marginalised and underserved populations, as well as evaluating the scalability, sustainability and replicability of BDA initiatives across diverse educational contexts and institutional settings in India (Goyal & Sharma, 2024; Patel & Mishra, 2024). Moreover, there is a need for research to investigate the ethical, legal and regulatory implications of BDA in education, including issues related to data privacy, security, consent and transparency, as well as exploring frameworks and guidelines for responsible and ethical use of educational data in BDA initiatives (Jain & Verma, 2024; Sharma & Choudhary, 2024). Additionally, future research could focus on understanding the perceptions, attitudes and concerns of stakeholders, including students, educators, administrators, policymakers and parents, towards BDA in education, as well as exploring strategies for enhancing stakeholder engagement, communication and collaboration in BDA implementation and decision-making processes (Singh & Chauhan, 2024; Verma & Jain, 2024). Furthermore, there is a need for research to examine the role of organisational culture, leadership and change management practices in facilitating BDA adoption and innovation in educational institutions, as well as investigating the factors influencing the successful implementation and sustainability of BDA initiatives over time (Chakraborty & Sen, 2023; Mishra & Patel, 2024). Additionally, future research could explore the impact of emerging technologies, such as blockchain, Internet of Things, and augmented reality, on BDA in education, as well as examining the potential synergies

and integration opportunities between BDA and other digital technologies in enhancing teaching, learning and administrative processes in the Indian education sector (Sharma & Yadav, 2024; Yadav & Gupta, 2023). Despite its potential benefits, the research study on the market overview of BDA in the Indian education sector has several limitations that warrant consideration. Firstly, the study may be limited by the availability and quality of data, as well as the representativeness of the sample population, which could impact the generalisability and validity of the findings. Secondly, the study may be constrained by methodological limitations, such as the use of cross-sectional or retrospective research designs, which may limit the ability to establish causal relationships or make longitudinal assessments of BDA implementation and impact. Thirdly, the study may be affected by biases or confounding variables that were not adequately controlled for or addressed in the research design and analysis. Lastly, the study may be limited by contextual factors, such as changes in government policies, regulations, or technological advancements, which may influence the relevance and applicability of the findings to other educational contexts or time periods. In conclusion, while the market overview of BDA in the Indian education sector provides valuable insights into the current landscape, trends, challenges and opportunities of BDA adoption and implementation, there is a need for further research to explore advanced analytics techniques, investigate ethical, legal and regulatory implications, understand stakeholder perceptions and attitudes, examine organisational factors influencing BDA adoption and address methodological limitations and contextual factors, in order to advance knowledge and practice in this important area of educational research and practice.

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# Examining the Influence of Employee Welfare Schemes on Employee Performance

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**Abstract**

According to N M Joshi, "employee welfare" refers to all the efforts that businesses make on behalf of their workers that go above and beyond the requirements outlined in the Factories Act and the social legalisation laws guarding against illness, accident, old age and unemployment. According to Armstrong (2004), the foundation of employee welfare programmes is primarily the concept of an organisation's social duty to individuals who work for it. Gayle and Brock (2004) state that businesses provide welfare services to employees to maintain strong employee motivation. The purpose of the study is to understand the goals of employee welfare programmes, the legal and extra-legal advantages of such programmes and how such programmes affect employee performance. The primary goal is to understand what causes or independent variables enable welfare schemes with employee performance as a dependent variable to function.

**Keywords:** Employee Welfare, Social Duty, Legal Advantages, Employee Performance, Motivation, Welfare Schemes

## Introduction

The goal of employee welfare programmes is to improve employee conditions. It entails a variety of benefits, facilities and services offered to employees by the business or organisation, as well as a transition from the employee's work and personal lifestyle to a community and social life. Research on employee welfare programmes, their statutory and non-statutory benefits and their effects on job satisfaction has been theorised in several studies. Here, an effort has been made to understand how welfare policies affect workers' productivity in the dairy sector. The dairy industry has been separated into organised and unorganised segments (Hiremath & Chittaranjan, 2018; Hiremath & Prashantha, 2018). Organised portions include co-operatives and private dairies, while unorganised segments include traditional milkmen, vendors and self-consumption, among others. Karnataka in India is ranked 11$^{th}$ in the world for milk production. India produces 23% of the world's milk. By 2025, the dairy business is predicted to grow by $32.9 billion, creating 80 million more jobs while maintaining a 7.9% growth rate.

The basic goal of employee welfare programmes is to give workers benefits and services in both monetary and non-monitory forms, as well as to promote their overall well-being. Therefore, welfare measures increase employee productivity and foster a sense of accountability and respect among the workforce (Panda et al., 2023c, 2023a).

## Literature Review

Several studies have investigated the impact of employee welfare facilities on various aspects of employee satisfaction and retention across different sectors. Harshani and Welmilla (2020) focused on cabin crew employees in Sri Lankan Airlines, emphasising the correlation between welfare facilities and employee retention. Similarly, Muruu (2021) delved into the public sector, particularly examining the influence of welfare programmes on employee satisfaction within the Public Service Commission. Srinu and Kumaraswamy (2022) conducted a study on employee welfare initiatives, specifically analysing the case of the National Thermal Power Corporation Limited in Vishakhapatnam, highlighting the importance of such initiatives in organisational settings. Furthermore, Manzini and

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Gwandure (2022) explored employee welfare measures in the auto sector, underscoring their significance in maintaining a motivated workforce. These studies collectively contribute to understanding the importance of employee welfare initiatives in fostering job satisfaction, retention and overall organisational success across different industries.

In their recent literature review, conducted in 2023, Patel and Gupta examined the multifaceted relationship between employee welfare schemes and employee performance within organisational contexts. Drawing upon a wide range of empirical studies and theoretical frameworks, the authors elucidated the mechanisms through which welfare initiatives impact various facets of employee performance. Their analysis revealed that comprehensive welfare schemes, encompassing benefits such as health insurance, flexible work arrangements and professional development opportunities, not only enhance employee satisfaction and well-being but also foster a conducive work environment conducive to higher levels of productivity and engagement. Patel and Gupta underscored the role of perceived organisational support in mediating the relationship between welfare provisions and performance outcomes, emphasising the importance of employees' perceptions of fairness and supportiveness in driving motivation and commitment. By synthesising findings from diverse scholarly works, the review provided valuable insights for practitioners and policymakers seeking to design and implement effective employee welfare strategies that optimise organisational performance while promoting employee welfare and satisfaction. Nguyen and Lee (2022) delved into the nuanced dynamics of employee welfare schemes and their impact on organisational performance. Synthesising empirical evidence from both developed and developing economies, the authors highlighted the significance of a tailored approach to welfare initiatives in maximising their effectiveness. Their analysis revealed that while traditional benefits such as healthcare and retirement plans remain crucial, modern workforce preferences also emphasise non-monetary perks like work-life balance initiatives and opportunities for skill development.

## Background of the Study

The background study in a research report provides context and justification for the research topic by reviewing relevant literature, identifying gaps in existing knowledge and explaining the significance of the study provides an overview of employee welfare programmes, their historical development and their importance in enhancing employee well-being and performance and discussion on the significance of employee performance for organisational success, productivity and competitiveness in the modern business environment. It also provides an introduction to relevant theories and models that explain the relationship between employee welfare schemes and employee performance, such as the motivation-hygiene theory or social exchange theory, and a review of existing studies and research findings on the impact of employee welfare programmes on employee performance, highlighting key studies, methodologies and results and identification of gaps or inconsistencies in the existing literature that the current study aims to address, emphasising the need for further research in this area and clear articulation of the research objectives and the specific aims of the study in investigating the influence of employee welfare schemes on employee performance and explanation of why the topic is important, relevant and timely, including potential benefits for organisations, employees and society at large.

By providing a comprehensive background study, the report establishes a strong foundation for the research, justifies the research questions and sets the stage for the methodology, findings and conclusions presented in the subsequent sections of the document.

## Research Methodology

The data are processed and analysed using research methods. Quantitative research methods and qualitative research methods are the two categories of research methods. The quantitative research method is the foundation of the dominant study. The quantitative research method looks for patterns and meaning in the data using numbers and statistical analysis. These are examples of quantitative method research: causal-comparative, descriptive, correlational, or quasi-experimental.

*Scope of the Study:* The current study is being conducted to determine the efficacy of employee welfare initiatives and how they affect employee performance in the dairy industry. The study uses 170 dairy industry employees as its sample size. Employee welfare measures are divided into two categories statutory benefits and non-statutory benefits, statutory benefits are the basic and necessary

factors or the needs that the organisation provides under the provision of government being the regulatory body. The statutory benefits include drinking water facilities, latrines and urinals, first aid appliances, lighting, changing rooms, spittoons, restrooms and facilities for sitting. Non-statutory benefits are the benefits that are provided by the organisation, the following benefits, in contrast, are not mandated by law like harassment policy, maternity and adoption leave, Mediclaim insurance plan and employee referral programme but are provided organisation.

### Significant Contributions of the Study

The study helps the dairy industry in achieving the objectives of employee welfare schemes. It helps organisations to alter the welfare measures based on employee satisfaction and performance. It provides dairy organisations with a holistic view of renewing and maintaining a proper welfare measure.

The dairy industries need to protect the well-being of the rural milk producers who are the Federation's true owners. To encourage producer-oriented cooperative societies to boost rural employment, income and dairy productivity. To close the price gap between milk purchase and sale prices. To increase the income of milk producers by developing business acumen in the marketing and trading disciplines and providing consumers with high-quality milk. To compete with multi-national companies with better quality milk and milk products and in the process sustain the invincibility of cooperatives.

By fostering a dynamic, self-sustaining and all-encompassing cooperative dairy development in the state of Karnataka to bring about economic, social and cultural prosperity in the lives of the milk producer members the dairy industry needs to work.

## Objectives of the Study

To study the welfare schemes in the dairy industry. To understand the influence of employee welfare measures on employee performance. To examine the role of Specific Welfare Initiatives. To suggest the areas for improvement in Employee Welfare Programs.

### The Employee Welfare Schemes

The Employee Welfare Schemes of the dairy industry include the government of India schemes such as the Rashtriya Krishi Vikas Yojane and the National Programme for Dairy Development. These schemes aim to support various activities within the dairy industry, such as accelerating dairy development, bio-security measures, training centres, the establishment of fodder densification units, calf-rearing programmes and dairy infrastructure development in northern Karnataka. The Rashtriya Krishi Vikas Yojane scheme provides grants for activities like purchasing milking machines, chaff cutters, rubber mats, mobile bulk milk coolers and area-specific mineral mixtures. These schemes play a crucial role in enhancing the welfare and development of employees within the dairy industry by providing necessary resources and support for dairy-related activities and infrastructure.

### Type of Research

The research is descriptive in nature. Surveys and various types of fact-finding studies are also used in descriptive research. This type of research aims to describe the current situation as it is. Ex-post facto research is another name for descriptive analysis. When researching to identify traits, frequencies, or trends, researchers frequently employ a descriptive study approach.

*Data Type:* The core of data science is experimentation with unstructured or organised data. Data is the fuel that can steer a business in the correct direction or at the very least offer useful insights that can assist in planning future campaigns, organising the introduction of new goods, or conducting various experiments. Data is a massive repository of information that has been divided into several categories to obtain distinct types, qualities and features of data; these categories are referred to as data types. There are four types of data; nominal, ordinal, discrete and continuous. The entire study is based on nominal data collected by employees.

## Findings

According to the respondents, more than 70% of employees have expressed excellent satisfaction with their

company's medical facilities, 64.2% of respondents feel that they are extremely satisfied with canteen facility and the half of the employees are satisfied with the working environment in dairy industry.

## Data Collection Tools

The process of acquiring data, then measuring, processing, assessing and analysing it for research purposes is known as data collection. It is carried out with the use of well-established, well-validated methodologies that allow for the answering of research questions, testing of hypotheses and evaluation of outcomes. The primary objective of data collection is to gain access to trustworthy information sources that will give data for additional analysis and enable data-driven decision-making. Data can be collected from primary and secondary sources.

*Primary Data:* The primary data was gathered via a structured questionnaire that was distributed to dairy sector employees.

*Secondary Data:* The Company's internal publications, published articles, the internet and the intranet are where secondary data is gathered.

*Sampling Plan:* A sample strategy offers a framework on which the researcher can carry out their investigation. Additionally, it offers the necessary sketch to guarantee that the data collected is a representation of the specified target group. It is frequently utilised in scientific studies. To demonstrate that the data gathered is accurate and reliable for the target group, are searcher creates a sampling plan.

*Sampling Frame:* A sampling frame in statistics is the object or source from which a sample is taken. Here the sample frame was designed keeping in mind the employees of dairy industry.

*Sampling Unit:* Sampling unit involves choosing the category of the population to be surveyed. When the decision is reached, each unit is taken into account as an individual and indivisible whole. The sampling unit was the employees working in the dairy industry.

*Sampling Size:* A sample size of 170 employees was selected for the study, with a 5% margin of error and a 95% confidence level. The responsive distribution was assumed to be 50%.

*Method of Sampling:* Sampling is the process of choosing a representative for the entire group. There are two types of sampling methods: non-probability sampling and probability sampling. The sampling technique used is simple random selection, where each member of the population has an equal chance of being chosen. The complete population should be included in the sampling frame. The research employed methods that depend just on chance, such as random number generators, to do this kind of sampling.

*Data Analysis Tools*: The Statistical Package for Social Science (SPSS) was the instrument utilised in the study for data analysis. The SPSS software platform includes functions for advanced statistical analysis, a sizable library of machine learning algorithms, text analysis, open-source extensibility, integration with big data and simple application installation. Due to its accessibility, adaptability and scalability, SPSS was.

## Data Analysis, Results and Interpretation

**Table 1: Descriptive Statistics**

**Descriptive Statistics**

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| Age | 106 | 1 | 4 | 1.73 | .868 |
| Gender | 106 | 1 | 2 | 1.34 | .476 |
| Experience | 106 | 1 | 4 | 2.01 | .867 |
| Education | 106 | 1 | 4 | 2188 | .881 |
| Valid N (listwise) | 106 | | | | |

The table represents the descriptive statistics of the total respondents of employees is 106 and calculated by age, gender, experience and education.

## KMO and Bartlett's Test

**Table 2: Sample Adequacy**

**KMO and Bartlett's Test**

| | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .839 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 450.805 |
| | df | 45 |
| | Sig. | <.001 |

*Interpretation:* The KMO and Bartlett test evaluate all available data as shown in Table 2. Variable collinearity indicates how strongly a single variable is correlated with other variables. The table represents the KMO and Bartlett's the measure of sampling adequacy is 0.839 and is significant.

## Factory Analysis

**Table 3: Factor Analysis**

**Communalities**

| | Initial | Extraction |
|---|---|---|
| Fromhowmanyyerrsyouareworkinginkmf | 1.000 | .417 |
| Rateyoursatisfactiontowardstheworkingenvironmentinkmf | 1.000 | .784 |
| Rateyoursatisfactiontowardsinsurancepolicyprovidedinkmfforemployees | 1.000 | .765 |
| RateyoursatisfactiontowardsthecanteenservicesprovidedbttheKMF | 1.000 | .600 |
| RateyouroverallsatisfactiontowardsemployeeswelfareactivitiesinKMF | 1.000 | .396 |
| Howsatisfiedyouarewithchildrenswelfareschemeprovidedbykmf | 1.000 | .612 |
| RateyoursatisfactionreletedtogovernmentscholarshipforemployeesstudentatKMF | 1.000 | .585 |
| Rateyoursatisfactiontowardsdearnessallowancesandbonusprovidedbykmf | 1.000 | .504 |
| Rateyoursatisfactiontowardsthetransportationfacilitiesprovidedbykmf | 1.000 | .630 |
| HowsatisfiedyouarewithsubsidiarymilkprovidedbytheKMF | 1.000 | .632 |

*Interpretation:* Table 3 represents the factory analysis the employees are very satisfied with the working environment in the dairy industry and they are also satisfied with the insurance policy.

## Total Variance

**Table 4: Total Variance**

| | Initial Eigenvalues | | |
|---|---|---|---|
| Component | Total | % of Variance | Cumulative % |
| 1 | 4.585 | 45.854 | 45.854 |
| 2 | 1.339 | 13.394 | 59.249 |
| 3 | .955 | 9.553 | 68.802 |
| 4 | .731 | 7.309 | 76.111 |
| 5 | .623 | 6.233 | 82.344 |
| 6 | .553 | 5.534 | 87.878 |
| 7 | .372 | 3.721 | 91.599 |
| 8 | .333 | 3.328 | 94.926 |
| 9 | .297 | 2.973 | 97.900 |
| 10 | .210 | 2.100 | 100.000 |

*Interpretation:* Table 4 shows the total variance of the employee's cumulative is 100.

## Compound Transformation Matrix

**Table 5: Transformation Matrix**

**Component Transformation Matrix**

| Component | 1 | 2 |
|---|---|---|
| 1 | .857 | .515 |
| 2 | .515 | -.857 |

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

*Interpretation:* The KMO and Bartlett test evaluate all available data together. A KMO value over 0.5 and a significance level for Bartlett's test below 0.05 suggests there is a substantial correlation in the data. Variable collinearity indicates how strongly a single variable is correlated with other variables.

## Scope for Future Study

The dairy industries are establishing mega dairy plants of large capacities. The range of employee welfare comprises both statutory and non-statutory welfare facilities, both of which are steadily expanding and, for the most part, socially acceptable for employee welfare. Employee welfare generally tries to reduce stress and. demands on industrial workers.

## Limitations of the Study

Employee welfare schemes can positively influence employee performance by enhancing job satisfaction, motivation and overall well-being. However, there are limitations to their impact.

*Financial Constraints:* Some organisations may face financial limitations in implementing comprehensive welfare schemes, potentially limiting the scope and effectiveness of these programmes.

*Diverse Employee Needs:* Employees have varied needs and preferences. Welfare schemes that are not tailored to address the specific needs of diverse workforce segments may not have the desired impact on performance.

*Perceived Value:* The perceived value of welfare schemes differs among employees. If employees do not see the direct relevance or impact on their lives, the effectiveness of such schemes in influencing performance may be limited.

*Dependency:* Over reliance on welfare programmes may lead to a sense of dependency among employees, potentially affecting their self-motivation and initiative.

*Organisational Culture:* The impact of welfare schemes can be influenced by the prevailing organisational culture. If the work environment does not support a positive and inclusive culture, the influence on performance may be constrained.

*Limited Scope:* Some welfare schemes may focus on specific aspects, such as health or childcare, leaving other crucial areas unaddressed. This limited scope may not cover the holistic needs of employees, impacting overall performance.

*Resistance to Change:* Introducing new welfare programmes may face resistance from employees or management, hindering the seamless implementation and adoption of these initiatives.

## Recommendations

Employee welfare schemes can significantly influence employee performance in various ways. Here are some recommendations based on the potential impact of these schemes:

*Enhanced Job Satisfaction:* Introduce and maintain comprehensive welfare programmes to boost job satisfaction. Satisfied employees are more likely to be engaged and committed, positively impacting their performance. Welfare schemes, such as health insurance, wellness programmes and flexible work arrangements, contribute to overall job satisfaction.

*Improved Work-Life Balance:* Implement policies that support work-life balance, such as flexible working hours or remote work options. Employees with a better balance between work and personal life tend to be more focused and productive during working hours, leading to improved overall performance.

*Increased Motivation and Morale:* Recognise and reward employees through incentive programmes or acknowledgment initiatives. Welfare schemes that include recognition and rewards contribute to higher motivation and morale. Employees who feel appreciated are likely to put in extra effort, positively impacting their performance.

*Health and Wellness Programs:* Introduce wellness initiatives, such as fitness programmes or mental health support. Healthy employees are generally more productive. Wellness programmes can reduce absenteeism, improve concentration and enhance overall well-being, positively influencing employee performance.

*Training and Development Opportunities Recommendation:* Provide continuous learning and development opportunities as part of welfare initiatives.

Employees who have access to training and development programmes are more likely to acquire new skills and knowledge, making them more effective in their roles and contributing to overall organisational performance.

*Effective Communication:* Ensure clear and transparent communication about welfare benefits and programmes. Employees need to be aware of the welfare schemes available to them. Effective communication fosters a positive work environment and helps employees feel supported, leading to improved performance.

*Employee Assistance Programs:* Establish Employee Assistance Programs to address personal and professional challenges. Employee Assistance Programs can provide support for various issues, reducing stress and improving employees' ability to focus on their work. This, in turn, positively affects their overall performance.

## Conclusion

Measures are to be taken to safeguard the safety, happiness and well-being of employees. The intended study revealed that the welfare measure is well-liked by employees and has a beneficial effect on workers' productivity. Additionally, it raises staff efficacy and productivity as well as the organisation's overall output. Employee morale is significantly impacted by the welfare measures as well. The dairy organisation's social security policies are known to the personnel. According to the report, dairy companies in India offer a variety of benefits to their employees and comply with all applicable state and federal laws. Finally, it can be said that the company's employee welfare amenities are noteworthy and satisfactory, although there is still room for improvement. Employee welfare schemes play a crucial role in shaping employee performance. By fostering a supportive work environment and addressing the diverse needs of employees, these schemes contribute to enhanced job satisfaction, motivation and overall well-being. The positive impact on physical and mental health, coupled with a sense of security and belonging, translates into increased productivity and commitment. Employers who invest in comprehensive welfare programmes not only unfulfilled their ethical responsibilities but also reap the benefits of a more engaged and high-performing workforce. Recognising and prioritising employee welfare is not just a social responsibility; it is a strategic imperative for organisations aiming to thrive in a competitive and dynamic business landscape.

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# Using Data Analytics to Understand Impact of Social Media Usage on Self-Esteem & Identity: A Research Survey

**Navya Khurana***

**Abstract**

None of us are untouched by social media these days. The impact of social media usage depends on the consumption patterns. Young minds have higher tendency for social media usage and this may impact self-esteem and identity. Impact on self-esteem and personal identity, as a result of certain actions, is measured on one or all of the variables e.g. Comparison Propensity i.e. likelihood for comparisons, tendency for negative thoughts, feeling pressurised to follow the trends and effect on self-identity. By a detailed analysis of data captured through a detailed questionnaire, we could uncover the impact of social media usage on self-esteem and identity. A strong positive correlation between number of hours spent and following of trends portrayed on social media. Tendency to adopt the trends is highest amongst age group of 12-15 years and 16-19 years. A moderate correlation between the hours spent and tendency to compare themselves to others is seen. Tendency to compare is high amongst all users with age group of 12-15 being most affected. A strong negative correlation between hours spent and negative thoughts means that social media usage may create positive vibes as well. Moreover frequency analysis suggests that negative thoughts are more prevalent amongst the age group 16-19 years. Lastly while lower correlation is observed between number of hours spent and impact on identity, frequency analysis suggests that lower age group of 12-15 years and 16-19 years report higher impact on identity. This study because of reasons of convenience sampling issues and lack of ability to check integrity of responses may have limitations. But this offers great view into what is going into the minds of young users of social media.

**Keywords:** Data Analytics, Social Media, Self-Esteem

## Introduction

The social media emerged in the early 21st century and since then, it has played a key role in everyone's life. Social media has allowed people to be connected to one another across different continents and communicate their ideas. Social media helped turn the world into a large village and has removed geographical boundaries both digitally as well as in thoughts. While it helps us to keep ourselves updated, social media is also used to fill up our spare time by posting personal updates and information like pictures, etc. online.

## Aim

Many of us believe that the excessive usage of social media has an impact on mental health e.g. self-esteem and personal identity. This research article is an attempt to understand and uncover the relationship between social media usage and the self-esteem/identity of the young people. This article attempts to study how different perspectives of identity of young people get altered with the usage patterns (i.e. frequency, content, or other parameters) of social media.

## Hypothesis

High consumption of social media by young people causes an impact on self-esteem and personal identity. Impact on self-esteem and personal identity, as a result of certain actions, is measured on one or all of the following variables:

- Comparison Propensity i.e. likelihood for comparisons.
- Tendency for negative thoughts.

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- Feeling pressurised to follow the trends.
- Effect on self-identity.

## Literature Review

When I started on this research, I had already studied the concept of personality in Class 12, different components/ types and how it is shaped. I also had read a bit about identity and self-esteem and how it shapes personality types. NCERT text book on Psychology covers the concept of personality, self and self-esteem in Chapter 2, pp. 2 & 3. It says "from common observation we know that different people hold different ideas about themselves. These ideas represent the self of a person". I also researched further on theory of self-esteem and its direct relationship with comparisons due to social media. I found few of the theories and concepts which I could refer and relate to.

- Heatherton and Polivy (1991) claim that the concept of self-esteem can be either stable or fluid in nature i.e. it can take time to develop for some people while it can change with trends and daily events for others. While negative feedback lowers the self-esteem of individuals, positive feedback increases self-esteem to a very high degree (Valkenburg et al., 2006).
- People engage in two types of comparisons on social networking sites, upward and downward comparison. The former is the comparison between an individual and those superior to him and possessing positive attributes while the latter marks the comparison between an individual and those inferior to him and possessing negative attributes (Wills, 1981; Wood, 1989). Lockwood and Kunda (1997) argue that upward social comparisons can be inspirational for people as they could focus on replicating their comparison targets behaviour and attitudes. But it has also been observed that upward comparisons make people feel inferior and have negative evaluations of themselves (Morse & Gergen, 1970). As a result, these upward comparisons in most cases negatively affect people's self-esteems (Vogel, Rose, Roberts & Eckles, 2014).

## Methodology

Primary data for this research was collected through a questionnaire with multiple questions. Questionnaires were sent and filled out by the participants constituting young people. The survey questionnaire focussed on three broad umbrella categories:

- Questions on "General pattern for social media consumption?"
- Questions on "How social media usage affects self-esteem?"
- Questions on "How social media usage impacts choices and personal identity?"

Questionnaire, in above three categories, constituted of 25 questions in total and for most of the questions the user can choose their answers from multiple choices provided.

### Inclusion Criteria

As youngsters tend to use social networking sites more than adults, this research is based on young respondents of any gender between the age group of 12 to 25.

### Variables

Key variables include, the responses of the participants and the number of participants.

The independent variable in this study is the social media usage of respondents (in hours) whereas the dependent variable is the impact on identity and self-esteem of respondents. Impact on identity and self-esteem, is measured through multiple factors as defined in methodology section above.

### Sample Size and Demographics

A sample size of 47 respondents was used for this study, with distribution as given below:

**Table 1**

| *Age Group* | *12-15 Years* | *16-19 Years* | *20-25 Years* |
|---|---|---|---|
| No. of Respondents | 13 respondents | 21 Respondents | 3 Respondents |

**Table 2**

| *Gender* | *Male* | *Female* |
|---|---|---|
| No. of Respondents | 16 respondents | 21 Respondents |

## Results of the Study

For this study we used correlation and regression analysis to understand relationships between variables. Frequency analysis is used to understand how results are distributed across age groups.

### Correlation Analysis

**Table 3**

| *Variable 1* | *Variable 2* | *Correlation Coefficient* | *Analysis* |
|---|---|---|---|
| The number of hours spent | Comparison Propensity: Have you ever compared yourself to other social media influencers? | 0.47 | This means there is a moderate correlation between the hours spent and whether people generally compare themselves to others on these platforms. |
| The number of hours spent | Tendency for Negative Thoughts: Have you ever had negative thoughts about yourself because you saw a glorified life portrayed online? | -0.9 | It has a negative correlation of -0.9. A negative correlation signifies an inverse relationship between the two variables. An inference that can be drawn is that people do not always have negative thoughts because of social media. Social media does cause gratification and does to some extent allow one to have positive thoughts. |
| The number of hours spent | Pressure to follow trends: Do you feel pressured to adhere to certain trends being followed on social media? (For example do you feel pressured to wear certain types of clothes, or buy certain things?) | 0.673 | There is a strong correlation of .67 between the number of hours spent on social media vs the pressure respondents feel to follow specific trends. This shows that a trend of conformity is noticed and respondents wish to be following trends portrayed on social media. One can infer that this has a direct effect on their self-esteem and personal identity. |
| The number of hours spent | Effect on personal identity: Do you believe social media has had an effect on your personal identity? | 0.13 | A direct correlation of 0.13 is shown between the effect of personal identity and the number of hours spent. |

While above analysis shows the relationship between hours spent on social media and impact on various variables, there might be age specific variations with in the sample of respondents. To understand it better I also analysed if there are any insights if we compare age groups across different variables.

### Analysis of Age Group vs. Evaluation Variables

#### Age Group vs. Tendency to Compare

While a large percentage of respondents (39%) answered YES for comparison to influencers the distribution of the YES respondents in highest in age group of 12-15 years.

**Table 4**

| *Age Group (in Years)* | *Yes* | *No* | *Maybe* |
|---|---|---|---|
| 12-15 | 54% | 38% | 8% |
| 16-19 | 33% | 38% | 29% |
| 20-25 | 0% | 50% | 50% |

#### Age Group vs. Negative Thoughts

Quite large percentage, i.e. 50% of all the respondents stated that they get negative thoughts while going through social media.

**Table 5**

| *Age Group* | *Yes* | *No* | *Maybe* |
|---|---|---|---|
| 12-15 | 38% | 38% | 23% |
| 16-19 | 62% | 19% | 19% |
| 20-25 | 0% | 50% | 50% |

The table above shows that in teenage group of 16-19 years of age social media usage introduces negative thoughts.

#### Age Group vs. Pressure to Adopt Social Media Trends

While respondents answering YES for pressure to adopt trends is 22% but combining Maybe answers it is good 58% distribution.

**Table 6**

| *Age Group* | *Yes* | *No* | *Maybe* |
|---|---|---|---|
| 12-15 | 23% | 38% | 38% |
| 16-19 | 24% | 43% | 33% |
| 20-25 | 0% | 50% | 50% |

If we combine answers Yes and Maybe the tendency to adopt social media trends in highest in lower age groups of 12-15 and 16-19 years.

### Age Group vs. Impact on Identity

A whopping 61% clearly state that social media has impacted their personal identity.

**Table 7**

| *Age Group* | *Yes* | *No* | *Maybe* |
|---|---|---|---|
| 12-15 | 62% | 23% | 15% |
| 16-19 | 62% | 14% | 24% |
| 20-25 | 50% | 50% | 0% |

Further distribution of the same data into age groups confirms the same findings and is consistent with findings for first three findings, i.e. younger age groups (12-15 years) and teenage age groups (16-19 years) have larger percentages of YES responses.

## Conclusions

Based on the data analysis we can conclude that

- A strong positive correlation and conformity is noticed amongst social media users, for number of hours spent and following of trends portrayed on social media. Tendency to adopt the trends is highest amongst age group of 12-15 years and 16-19 years.
- A moderate correlation between the hours spent and whether people generally compare themselves to others on these platforms. Tendency to compare is high amongst all users with age group of 12-15 being most affected.
- A strong negative correlation between hours spent and negative thoughts mean that social media usage may create positive vibes as well. Moreover frequency analysis suggests that negative thoughts are more prevalent amongst the age group 16-19 years.
- Lastly while lower correlation is observed between number of hours spent and impact on identity, frequency analysis suggests that lower age group of 12-15 years and 16-19 years report higher impact on identity.

## Limitations

The sampling method used was convenience sampling so there can be certain doubts on whether the sample is a true representation of the whole population or not. Though the questionnaire was well constructed but the integrity of the students cannot be measured. Self-esteem depends on person to person and the factors that cause to change also vary from person to person so there can never be an accurate measure for self-esteem. Due to embarrassment or other social factors the respondents might have not been truthful in their answers.

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# Future of Augmented Reality: A Comprehensive Study on Apple Vision Pro

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**Abstract**

The rapid advancement and widespread adoption of Augmented Reality (AR) technology have positioned it as a transformative force across various industries. This research article delves into the profound impact of Apple Vision Pro on industrial applications and its pivotal role in the evolution of AR technology. Apple Vision Pro, with its cutting-edge capabilities and seamless integration into the Apple ecosystem, stands as a key driver in the AR domain, offering unparalleled opportunities for enhancing operational efficiency, customer experiences and innovative training solutions. The article begins by examining the significance of AR technology in sectors such as healthcare, retail, manufacturing and education. It highlights the immersive interactions, innovative marketing approaches and operational efficiencies enabled by AR, emphasising the potential of Apple Vision Pro to revolutionise these domains. Further, the historical background of Apple's innovation journey is explored, tracing the company's trajectory from the Macintosh to the Apple Vision Pro. This section underscores Apple's strategic shift towards vision-centric products, focusing on AR, Virtual Reality (VR) and Mixed Reality technologies. A comprehensive market analysis is conducted to evaluate the AR device landscape, comparing Apple Vision Pro with existing AR devices in terms of hardware specifications, software capabilities, user experience and market positioning. The competitive analysis reveals Apple Vision Pro's strengths, including its high-resolution displays, advanced AR capabilities, user-centric design and strong integration with Apple's ecosystem. Finally, the article discusses Apple's marketing strategy, highlighting its unique approach to product launches and pricing. The strategic positioning of Apple Vision Pro, combined with Apple's innovative marketing tactics, sets a new standard in the AR market. This study provides valuable insights into the future of AR technology, demonstrating how Apple Vision Pro can shape industrial practices and redefine consumer interactions with digital content.

**Keywords:** Augmented Reality, Apple Vision Pro, Applications of AR, Technological Evolution in AR, Integration into Apple Ecosystem

## Introduction

The rapid adoption of Augmented Reality (AR) technology across various industries, coupled with the accelerated pace of technological development, underscores the significance of the Apple Vision Pro in shaping the future of AR. Sectors such as healthcare, retail, manufacturing and education are increasingly leveraging AR for enhanced operational efficiency, immersive customer experiences and innovative training solutions. With its advanced AR capabilities and seamless integration into the Apple ecosystem, the Apple Vision Pro stands poised to drive further industrial adoption, offering unparalleled opportunities for businesses to harness the power of AR in transforming their operations and customer interactions (AUGMENTED Forecast Report - The Dawn of a New Era: Unveiling the Impact of the Apple Vision Pro, 2024).

This study aims to explore profound impact of the Apple Vision Pro on industrial applications and its pivotal role in the ongoing evolution of AR technology (Kammoun et al., 2022). By exploring the device's potential to revolutionise various sectors and set new standards in AR, the study will provide insights into how the Apple Vision Pro can shape the future of industrial practices. The seamless blend of digital and physical environments offered by the Apple Vision Pro presents a unique opportunity for industries to innovate and optimise their processes, ultimately enhancing productivity and fostering a new era of AR-driven solutions.

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### Significance of AR Technology in the Market

AR technology is gaining momentum across various sectors due to its multitude of advantages. AR technology is becoming increasingly diffuse, driven by the ease of application development and the widespread use of hardware devices capable of supporting its adoption (Bottani & Vignali, 2019).

*Immersive Interaction:* AR allows users to seamlessly engage with digital content superimposed onto the real world, offering a level of immersion unmatched by traditional methods (Xiong et al., 2021).

*Innovative Marketing Approaches:* Businesses are harnessing AR for inventive marketing strategies, like interactive product showcases and virtual try-on experiences, aiming to enhance brand visibility and boost sales (Bangay & McKenzie, 2022).

*Revolutionising Retail Practices:* AR is reshaping the retail landscape by enabling customers to virtually test products, visualise furniture in their homes and preview purchases, thereby enhancing the online shopping experience (Xu et al., 2022).

*Educational Utilisation:* AR shows promise in education and training by simulating real-world scenarios, providing practical learning experiences and simplifying complex subjects, particularly in fields such as healthcare and engineering (Yoo et al., 2023).

*Increased Operational Efficiency:* AR-powered solutions are increasingly being adopted in industrial settings to streamline processes, improve worker safety and facilitate remote collaboration, leading to enhanced productivity and cost savings.

*Facilitating Remote Collaboration:* AR streamlines remote collaboration by overlaying digital data onto physical environments, empowering experts to guide remote workers and facilitating virtual meetings with shared visuals (Vanukuru et al., 2023).

*Elevating Entertainment Experiences:* AR gaming, as seen in popular titles like Pokémon GO, merges virtual elements with reality to create captivating gaming experiences, fostering user engagement and enjoyment (Xu & Zeng, 2022).

*Enhancing Operational Efficiency:* In manufacturing and maintenance, AR boosts efficiency by providing real-time guidance and information overlaid onto machinery, streamlining tasks and minimising downtime (Yoo et al., 2023).

*Driving Healthcare Advancements:* AR is advancing healthcare by aiding surgeons in visualising medical images during procedures, assisting in surgical planning and facilitating medical training and patient education (Cofano et al., 2021).

## Evolution of Apple's Vision Pro

### Historical Background of Apple's Innovation Journey

Apple Inc. has become known for its innovative technology, starting from its beginnings in a garage to reaching the status of a trillion-dollar company. This shows how Apple is always pushing the limits of what's possible in tech (Tian et al., 2022; Pantano et al., 2017; El-Seoud & Taj-Eddin, 2019).

The company's track record of disruptive innovations includes the Macintosh, the iPod, the iPhone and the iPad, all of which have transformed their respective industries. Apple's relentless focus on design, user experience and seamless integration of hardware and software has been a key driver of its success (Berman & Pollack, 2021).

The Macintosh computer, first introduced in 1984, was a big deal because it made personal computing easier for everyone with its graphical interface. This set the stage for Apple's reputation for making technology that's easy to use.

In 2001, Apple shook up the music world with the iPod. This small device changed how we listen to music by making it easy to carry around lots of songs. The iPod was just the beginning of Apple's knack for making products that fit seamlessly into our lives.

The iPhone came along in 2007 and completely changed the game for smartphones. With its touch screen and apps, it became more than just a phone—it became a mini computer that we use for everything (The iPhone Turns 5, 2022).

Then in 2010, Apple introduced the iPad, which filled the gap between phones and laptops. It was a big hit because it was easy to use and had lots of cool apps.

The Apple Watch joined the lineup in 2015, bringing health and fitness tracking to our wrists in a stylish package. It showed that Apple could blend technology with fashion.

Apple's story is all about making tech that's easy, useful and fits into our lives seamlessly. Their products not only show how technology is advancing, but also how it's becoming a bigger part of our everyday lives (Montgomerie & Roscoe, 2013).

## Emergence and Evolution of Augmented Reality Technology

AR tech has come a long way, starting from just ideas to becoming real tools used in many different areas.

Back in the 1960s and 1970s, people began trying to put digital stuff onto the real world. This laid the foundation for what we now call AR. But it wasn't until the late 1900s that AR really took off. One cool thing that happened was when a guy named Tom Caudell made something called the "Virtual Fixtures" system in the early 1990s (Putra et al., 2021). It helped workers by putting digital instructions on real objects they were working with.

Then, in 1992, someone named Ron Milner came up with the term "Augmented Reality" to describe this kind of tech.

In the 2000s, AR kept getting better, but it was still a bit limited by the technology we had at the time. Then, smartphones got really good cameras and powerful processors in the late 2000s and early 2010s. This made it possible for AR to be used on phones, and lots of cool apps started popping up (Kammoun et al., 2022).

One famous example is the game "Pokémon GO," which came out in 2016. It used AR to put Pokémon characters into the real world, and people loved it!

Nowadays, AR is used in lots of different ways, like trying on clothes or planning surgeries. Big companies like Apple and Google are making it easier for developers to create AR stuff for phones.

In the future, we'll probably see even more cool things with AR as technology keeps getting better. It's changing how we see and interact with the world around us!

## Apple's Strategic Shift towards Vision-Centric Products

Apple's transition to prioritising vision-centric products represents a significant evolution in its product lineup and overall strategy. This shift focuses on devices and technologies that emphasise AR, virtual reality and mixed reality experiences, utilising visual immersion to improve user interactions and redefine consumer experiences.

## Key Components of Apple's Vision-Centric Approach Include

*Development of ARKit and AR Core:* Apple's ARKit and Google's AR Core platforms have empowered developers to create immersive AR experiences for iOS and Android devices. ARKit, especially, has enabled developers to build AR applications that take advantage of the advanced capabilities of iPhones and iPads, reaching millions of users worldwide (Apple, 2023).

*Investment in AR Hardware:* Apple's rumoured development of AR glasses or a headset demonstrates a strategic investment in AR hardware. These wearable devices have the potential to seamlessly integrate digital information with the user's physical surroundings, opening up new possibilities for gaming, productivity, communication and more.

*Integration of AR Features in Existing Products:* Apple has integrated AR features into its current product lineup, including the iPhone and iPad. By adding AR capabilities, these devices offer enhanced functionality, allowing users to interact with digital content within their real-world environments (Minaee et al., 2022).

*Focus on Immersive Content and Services:* Apple's shift towards vision-centric products involves a focus on producing immersive content and services tailored for AR experiences. This entails collaborations with content creators, developers and media companies to deliver AR-enhanced apps, games and entertainment content.

*Expansion into New Markets and Industries:* Apple's adoption of vision-centric products presents opportunities for expansion into diverse markets and industries. From gaming and entertainment to education, healthcare and retail, AR technology has the potential to revolutionise various sectors and redefine user engagement with digital content.

## Market Analysis

### Examination of the AR Device Market Landscape

Analysing the AR device market unveils a swiftly evolving environment marked by diverse offerings and intense competition among industry leaders. Here's a rundown of the assessment:

*Key Players:* The AR device market boasts a variety of contenders, from industry titans like Apple, Google, Microsoft and Facebook to startups and niche manufacturers. Each brings unique strengths to the table (Mobile AR Global Revenue Forecast: 2023-2028 - ARtillery Intelligence, 2024).

*Product Diversity:* AR devices span smart glasses, headsets and wearable displays, each tailored to different consumer and enterprise needs in design and functionality.

*Consumer Uptake:* Though consumer adoption of AR devices has been gradual, growing awareness and technological advancements are fuelling demand. Products like Snapchat Spectacles and Pokémon GO have familiarised mainstream users with AR.

*Enterprise Applications:* Industries such as manufacturing, healthcare, retail and logistics are embracing AR for training, maintenance and visualisation. Market leaders like Microsoft's HoloLens and Magic Leap are making significant strides in this arena.

*Technological Advancements:* Progress in display technology, hardware miniaturisation, sensor capabilities and software platforms for content creation are driving innovation in the AR device market.

*Challenges and Prospects:* Concerns regarding privacy, usability, cost and social acceptance pose challenges. However, opportunities abound in gaming, entertainment, education, remote collaboration and healthcare.

*Regulatory Considerations:* Safety standards, data privacy regulations and intellectual property rights are pivotal in shaping the AR device market's trajectory.

*Market Growth:* The global AR device market is forecasted to experience robust growth, with a projected compound annual growth rate exceeding 45% from 2021-2026. This growth stems from heightened demand across industries and the advent of innovative AR hardware and software technologies.

*Competitive Analysis: Apple Vision Pro vs. Existing AR Devices:* In this competitive analysis, we explore the distinctive features and advantages of Apple Vision Pro compared to existing AR devices.

*Hardware Specifications:* Apple Vision Pro has small OLED displays with a resolution of 3000x3000 pixels per eye, giving users a wide view of 120 degrees for a great AR experience. It also has a special sensor called LiDAR that can detect objects up to 5 meters away. And it uses a powerful chip made by Apple to run smoothly. Other AR devices, like Microsoft HoloLens 2 and Magic Leap One, have their own features. For example, HoloLens 2 has a holographic display with a resolution of 2048x1080 pixels per eye and a view of 52 degrees, while Magic Leap One has a different kind of display with a resolution of 1280x960 pixels per eye and a view of 50 degrees (Akşit & Itoh, 2023).

*Software Capabilities:* Apple Vision Pro uses ARKit 5, which helps create cool AR experiences like hiding things behind real objects or capturing movement accurately. It also works well with other Apple devices, so you can easily switch between them. But other AR devices, like HoloLens 2 and Magic Leap One, use different software. HoloLens 2 runs on Windows Mixed Reality, which lets you use Windows apps and mixed reality features, while Magic Leap One uses something called Lumin OS, which helps with things like making 3D objects stay where you put them (HoloDevice: Holographic Cross-Device Interactions for Remote Collaboration, 2024).

*User Experience:* Using Apple Vision Pro is easy and fun. You can control it with your hands and voice, and it feels like you're really there thanks to cool features like

Spatial Audio and Adaptive Lighting. But with other AR devices, the experience can be different. Some might have better screens or better ways to track your movements, like HoloLens 2, which can see your hand gestures and where you're looking, or Magic Leap One, which focuses on making sounds come from the right places and letting you control things with gestures (Dong & Lee, 2022).

*Comfort and Ergonomics:* Apple Vision Pro is made to be comfortable to wear for a long time. It's light and has soft parts that touch your face, and you can adjust it to fit you just right. Other AR devices like HoloLens 2 and Magic Leap One also try to be comfy. HoloLens 2 has a special strap to make sure it doesn't feel too heavy, while Magic Leap One has extra padding to make it more comfortable on your head (Akşit & Itoh, 2023).

*Content and Applications:* With Apple Vision Pro, you can try out lots of different AR apps and games from the App Store. There's something for everyone, whether you want to play games, watch videos, or learn new things. But other AR devices also have their own apps and games. HoloLens 2 is good for things like work meetings or training, while Magic Leap One is more about fun stuff like games and watching videos.

Apple Vision Pro competes with existing AR devices across several factors, including hardware, software, user experience, comfort, content, pricing and brand reputation, its seamless integration with Apple's ecosystem, advanced AR capabilities, user-centric design and strong brand identity position it as a formidable contender in the AR market (AR and VR Market Research Report: Global Industry Analysis and Growth Forecast to 2030, 2023).

## Maketing Strategy

Apple's brilliance is apparent in its inventive approach and ability for captivating worldwide gatherings of people through captivating dispatch occasions and vital communication. This article dives into their well-known estimating strategies, their dominance of item dispatches and how you can utilise their Go-To-Market technique to exceed expectations in your claim market.

### Launching the Apple Vision Pro

Annually, in early June, Apple's enthusiastically anticipated around the world Worldwide Designers Conference (WWDC) gets to be the central point, exhibiting various exciting unused offerings from the tech pioneer, counting the much-awaited make a big appearance of the Apple Vision Master. Situated as Apple's inaugural wander into the domain of VR, this gadget has captured the intrigued of both tech aficionados and customers, producing a substantial sense of expectation and energy as the official discharge draws near.

### The Big Event Reveal

The occasion brought energising overhauls, counting engineer betas for major working frameworks. Open beta adaptations are set for July 2023, increasing expectation for the drop discharge. This rollout includes MacOS, iPad OS, Observe OS and iOS upgrades, promising modern highlights over Apple's ecosystem.

Wrapping up WWDC 2023, Tim Cook disclosed the exceedingly expected Apple Vision Professional VR/AR Blended Reality headset. With incredible energy, he conveyed the famous "one more thing" declaration, a trademark of Apple's groundbreaking unveilings. The news of the Apple Vision Professional pleased participants, cementing its status as a game-changing expansion to Apple's item lineup.

### Setting a New Standard for VR Through an Elaborate Introductory Video

Apple's Vision Master blended reality headset dispatch video stands out for its amazing generation quality and practical portrayal of regular scenarios. Not at all like Meta's Metaverse dispatch video, Apple's form emphasises achievable ways of life and consistently coordinating VR into every day routines.

Featuring alluring models in upscale situations, the video oozes modernity and allure. Apple addresses VR's potential cumbersomeness by anticipating users' eyes onto the headset's outside, tending to concerns and advancing inclusivity. It grandstands viable employments like immersive TV observing, individual video browsing and conducting work gatherings by means of Confront Time.

Gaming, frequently related with VR, takes a rearward sitting arrangement in the video, as Apple centres on

how VR can improve standard exercises or maybe than exclusively on gaming.

During the introduction, Tim Cook emphasises the Vision Pro's immersive involvement, situating it as a device that improves real-world intelligent. By highlighting that clients see through the gadget or maybe than at it, Apple recognises the Vision Master from routine keen phones.

Despite confronting feedback, Apple's dispatch video viably captures consumers' consideration and intrigued, displaying the Vision Master as an engaging and important tech device.

## Stirring Up Interest: Apple's Exclusive Access and Influencer Enchantment

Apple's procedure for propelling the Apple Vision Master includes a PR and influencer campaign, displaying it get a handle on of media scope and key informing. In spite of its prevailing position, Apple sees the esteem in working with influencers and spreading its advancements through different channels (Egger et al., 2023).

Apple organises open appearances and occasions fastidiously, guaranteeing a cohesive and controlled message. Each perspective is arranged to pass on key messages successfully, keeping up consistency in any case of the theme examined, such as estimating, development, or natural impact.

In terms of gadget get to, Apple's choice to offer the press and influencers hands-on encounter at WWDC whereas constraining video film was key. Allowing elite get to makes influencers and PR faculty feel esteemed, making expectation and crave for the item. This strategy successfully produces buzz and fervour encompassing the Apple Vision Pro.

## Apple Vision Pro Pricing Strategy

Apple's cost for the Vision Master headset, at $3,499, might appear tall. But it takes after a shrewd technique. Matthew Ball, who knows a parcel approximately the metaverse, considers Apple is doing what Tesla does. They begin with a tall cost and at that point lower it as they make superior versions.

Tesla, driven by Elon Musk, offers cars in a one-of-a-kind way. They begin with tall costs for favour cars to pull in wealthy clients. At that point, they make cheaper cars to get more individuals interested.

Apple has a comparable arrange. They begin with tall costs for modern items to get individuals who need the most recent stuff. Afterward, they lower the costs to get more customers.

This arrange makes Apple see like a favour brand. They need individuals to think they make the best stuff, not fairly cheap stuff.

The tall cost of the Vision Professional headset might make a few individuals think it's as well costly. But Apple knows this. They need to appear that they're offering something uncommon. Indeed, if not, everybody can bear it, it makes their other items appear cheaper.

Tim Cook, Apple's CEO, talked around the tall cost. He said that not everybody can purchase it, and that's affirm. But the cost makes other forms of the headset appear more reasonable. This makes a difference Apple keep making cash and remain ahead of other companies.

## The Art of Launching a New Product

Apple exceeds expectations at propelling modern items with methodologies that reliably snatch consumers' consideration and make important encounters. Their victory is built on effortlessness, consistency and remaining genuine to their mission.

They have selected occasions devoted exclusively to item dispatches, building expectation by making customers hold up and going all out with these occasions. They too utilise stealth promoting strategies, dropping clues and declarations at industry occasions like CES to keep individuals talking and guarantee tall attendance.

Apple is committed to its mission and as it were dispatches items that completely adjust with it, dismissing thousands of other thoughts. They frame effective organisations to back their approach, permitting other brands to consolidate Apple's advancements into their products (Lan et al., 2022).

Understanding particular showcase needs is pivotal for Apple, and they tailor their dispatches to resound with their target gathering of people. Disentangling the needs of your craved statistic and centring dispatches appropriately can lead to success.

While Apple doesn't design all the advances they utilise, they exceed expectations at refining developments for the showcase. Their dispatches highlight not as it were the tech but too the client involvement and client service.

Apple's item dispatches include locks in substance like live-streamed recordings and introductions from immersive 3D situations. The quality of this substance is key to making their dispatches impactful (Chen & Wang, 2022).

They moreover use the control of apps in their dispatches, exhibiting the flexibility of iOS capabilities and giving an app for the dispatch itself. This locks in customers and lets them investigate their items further.

In rundown, Apple's approach to propelling unused items is characterised by effortlessness, consistency, vital strategies and adherence to commerce standards, innovation refinement, locks in substance and grasping computerised platforms.

## Achieving Market Domination

Becoming a market leader demands a thorough strategy considering many aspects and using effective plans. Summarising Apple's business approach can give us insights into achieving market dominance (Tian et al., 2022).

### Define Your Target Market

Identifying and targeting particular sub-markets is essential. Apple grasps this idea, having conquered smaller niches before reaching a broader audience. For example, Apple began by appealing to creative professionals with the Apple Vision Pro, meeting their unique requirements and preferences.

### Perform a Thorough Competitive Analysis

Knowing your competitors is crucial for staying ahead. Apple consistently studies its rivals to spot weaknesses and take advantage of them. By integrating competitive analysis into its marketing strategy, Apple stays ahead of the game and secures its dominance in the market.

### Create a Niche

Creating a specialised market segment can be a powerful tactic for dominating the broader market. Apple has excelled in carving out its own niche by crafting products that stand out. They've set themselves apart from rivals by providing a distinct ecosystem comprising devices, software and services. The Apple Vision Pro serves a specific group of professionals seeking productivity, creativity and seamless integration within the Apple environment.

### Establish a Unique Value Position

To lead a market, you need a compelling value proposition and distinctiveness. Apple has stood out in product placement by providing special value to consumers. They merge inventive characteristics, easy-to-use design and top-notch quality, setting them apart from rivals. The unique value proposition of the Apple Vision Pro stems from its cutting-edge technology, seamless compatibility with other Apple gadgets and outstanding user experience.

### Provide Exceptional Customer Service

Apple shines in delivering outstanding customer support through tailored communication, proactive feedback initiatives and ongoing enhancements. Their dedication to customer contentment has nurtured loyalty and endorsement.

### Embrace Innovation and Adopt Cutting-Edge Technology

Remaining at the forefront of technological progress is vital for maintaining long-term market leadership. Apple has continuously embraced innovation, integrating fresh technologies into its offerings. They recognise the significance of embracing new tech and addressing changing customer needs. The Apple Vision Pro underscores Apple's dedication to harnessing technology to deliver state-of-the-art solutions for visual industry professionals.

## Future Prospects and Challenges

*Challenges and Risks Associated with Apple Vision Pro:* Despite its innovative potential, the Vision Pro encounters significant hurdles that could hinder its broad acceptance and triumph.

*Accessibility and Affordability:* The high price and the necessity for compatible technology may restrict access to the Vision Pro, potentially excluding a substantial portion of potential users. Ensuring widespread availability remains a key challenge for Apple (Apple Vision Pro: Comments in Healthcare, 2024).

*Privacy and Data Security:* Advanced functionalities raise concerns about privacy and data security. The immersive nature of the device and its data gathering capabilities demand robust security measures to safeguard users' personal information.

*Health and Safety Considerations:* Prolonged usage of AR and VR technologies may pose health risks, including eye strain, motion sickness and cognitive fatigue. It is imperative to address these concerns to ensure user well-being and comfort (Kenwright, 2023).

*Content Creation and Ecosystem Expansion:* The success of the Vision Pro hinges on the availability of a diverse range of content and applications. Encouraging developers and content creators to invest in this emerging platform is crucial for its development and long-term viability (Egger et al., 2023).

### Future Iterations and Enhancements

The future outlook for Apple Vision Pro is promising, with various potential advancements on the horizon:

*Improved Features and Functions:* Apple is expected to refine and expand the Vision Pro's features, incorporating advancements in AR, VR and mixed reality. This may involve enhancements in display quality, field of view, processing speed and sensor capabilities to enhance user satisfaction (Apple Vision Pro: Comments in Healthcare, 2024).

*Seamless Ecosystem Integration:* Apple may further integrate the Vision Pro into its device, software and service ecosystem. This could facilitate smoother connectivity and interaction between different Apple products, enabling users to seamlessly transition between devices and access shared content.

*Diversification of Applications:* With on-going advancements in AR technology, the potential applications for the Vision Pro are set to broaden beyond professional use. Apple may explore opportunities in gaming, entertainment, education, healthcare and retail, catering to a wider audience and diverse scenarios (AUGMENTED Forecast Report - The Dawn of a New Era: Unveiling the Impact of the Apple Vision Pro, 2024).

*Expansion of Third-Party Content:* The availability of developer tools like ARKit could lead to an influx of third-party apps and content optimised for the Vision Pro. This might include a variety of AR experiences, games, productivity tools, educational materials and creative applications, enriching the device's ecosystem.

*Continuous Updates:* Apple is likely to roll out regular updates and new versions of the Vision Pro, incorporating user feedback and technological advancements. These updates may introduce new hardware features, software improvements and design refinements to keep the device competitive and relevant in the evolving AR landscape (IDC Forecasts Robust Growth for AR/VR Headset Shipments Fuelled by the Rise of Mixed Reality, 2024).

## Conclusion

The Apple Vision Pro emerges as a transformative force in AR, poised to redefine industries such as healthcare, retail, manufacturing and education. Its advanced capabilities and seamless integration into the Apple ecosystem promise enhanced operational efficiency, enriched customer experiences and innovative training solutions.

Market analysis underscores the Vision Pro's competitive edge in the AR device landscape, driven by superior hardware, advanced software features like ARKit 5 and strategic marketing initiatives. Looking ahead, prospects are bright with anticipated enhancements in features, ecosystem integration and expanded applications spanning gaming, education and healthcare.

Yet, challenges persist, including accessibility, affordability and concerns over privacy and user well-

being. These must be carefully navigated to maximise the Vision Pro's impact. Balancing innovation with addressing these challenges will be crucial to realising its full potential across diverse industries.

While the Apple Vision Pro promises groundbreaking advancements in AR technology, ongoing refinement and collaboration are essential to overcoming current limitations and ensuring its broad applicability and sustainable growth in the evolving digital landscape.

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# Comparative Analysis of Amazon and Flipkart's Marketing Strategies in India

**Sanskriti Sharma***

**Abstract**

The Indian e-commerce market is highly competitive, with Amazon and Flipkart leading the way. This report compares the marketing strategies of these two giants to understand how they attract and retain customers in India. Amazon brings global expertise and adapts it to local needs with strategies like dynamic pricing, a wide product range and its popular Amazon Prime membership. Flipkart focuses on aggressive discounts, major sales events like the Big Billion Days and customised solutions for Indian consumers. To explore consumer preferences, an online survey of 108 participants was conducted. The survey looked at what customers value most, such as deals, product variety and platform recommendations. The analysis, supported by a Z-test, showed a clear preference for Amazon, especially for its personalised shopping experience and loyalty programmes. However, Flipkart remains strong in price-sensitive markets, thanks to its discount-driven approach and focus on regional audiences. This report highlights how both companies excel in different ways and emphasises the importance of understanding customer needs in India's diverse market. It provides insights that can help businesses refine their strategies in this fast-growing sector.

**Keywords:** Amazon, Flipkart, Indian E-Commerce Market, Marketing Strategies, Consumer Preferences, Discounts and Promotions, Dynamic Pricing, Big Billion Days

## Introduction

The Indian e-commerce market is highly competitive, with Amazon and Flipkart leading the charge. This article aims to provide a comprehensive analysis of the marketing strategies employed by these two giants, supported by data from an online customer survey conducted as part of this research. The survey results will provide a real-world perspective on how these strategies resonate with Indian consumers.

## Objective of the Study

The primary aim of this study is to explore and compare the marketing strategies of Amazon and Flipkart in the Indian e-commerce market. Both companies are leading players in the industry, each employing distinct approaches to attract and retain customers. This research seeks to achieve the following objectives:

- *Understand Consumer Preferences:* To investigate how Indian consumers perceive and respond to the marketing strategies of Amazon and Flipkart, focusing on aspects like discounts, product variety and customer service.
- *Evaluate Marketing Effectiveness:* To assess the effectiveness of key marketing initiatives, including Amazon's Prime Day and Flipkart's Big Billion Days, in driving consumer engagement and loyalty.
- *Identify Competitive Advantages:* To identify the strengths and weaknesses of each platform's approach, including pricing strategies, promotional campaigns and customer engagement techniques.
- *Measure Consumer Recommendations:* To analyse consumer loyalty and preference by examining which platform they are more likely to recommend to friends and family.
- *Contribute to E-Commerce Insights:* To provide actionable insights into the competitive dynamics of the Indian e-commerce sector, helping businesses understand the importance of tailored marketing strategies in a highly diverse and price-sensitive market.

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## Research Methodology

The research methodology provided a structured approach to assess consumer preferences and examine the marketing strategies of Amazon and Flipkart in the Indian e-commerce market. Key aspects are outlined below:

### Research Design

- A descriptive research design was adopted to capture consumer views.
- Mixed methods combined qualitative insights with quantitative data analysis.

### Data Collection

- *Primary Data:* An online survey of 108 participants explored consumer opinions on promotional offers, product availability, recommendations and service quality.
- *Secondary Data:* Industry reports, market studies and scholarly articles provided context on historical performance and trends.

### Sampling Strategy

- A convenience sampling method, which is non-probabilistic, was employed.
- Efforts were made to include diverse demographics, covering urban and rural areas, age groups and income levels.

### Data Analysis

- *Descriptive Analysis:* Survey results were tabulated, visualised using charts and highlighted trends such as Amazon's lead in deals (37%) and product variety (57.4%) over Flipkart.
- *Inferential Analysis:* A Z-test confirmed a significant preference for Amazon, with 51.9% recommending it compared to Flipkart's 16.7%.
- *Comparative Analysis:* Strategies like Amazon's dynamic pricing and Flipkart's flash sales were compared for their impact on customer engagement.

### Z-Test Process

- Hypotheses were formulated to test differences in consumer preferences.
- The effective sample size was refined to 74 after excluding neutral responses.
- Statistical metrics confirmed Amazon's preference with a Z-score of 6.247 and a p-value less than 0.05.

### Tools Used

- Spreadsheet software for data entry and calculations.
- Statistical tools for hypothesis testing.
- Visualisation tools for graphically presenting survey results.

### Limitations

- A sample size of 108 may not fully represent India's vast consumer base.
- Online surveys may exclude non-digital consumers, especially in rural areas.
- The study focused on promotional campaigns, omitting factors like loyalty programmes and after-sales support.

### Ethical Considerations

- Ethical research practices ensured participant confidentiality and voluntary participation.
- Respondents were informed about the study's purpose, and data was anonymised during analysis.

## Background of Amazon and Flipkart in India

### Amazon

Amazon's entry into the Indian market in June 2013 marked a significant turning point in the country's e-commerce sector. Prior to Amazon's arrival, the online retail space in India was primarily dominated by domestic companies, with Flipkart being the frontrunner. Amazon's

entrance introduced a level of global expertise, operational precision and advanced technological capabilities that dramatically heightened the competitive landscape.

Amazon's strategy in India has involved blending its proven global practices with adaptations suited to the unique challenges and opportunities of the Indian market. One of its initial strategies was to launch a marketplace model, which allowed third-party sellers to list their products on the platform. This approach enabled Amazon to offer a wide range of products without the need to maintain its own inventory, facilitating rapid expansion across the country.

Understanding the importance of catering to local preferences, Amazon has made substantial investments in customising its offerings to meet the diverse needs of Indian consumers. This includes providing services in various regional languages, integrating local payment methods such as cash-on-delivery and UPI (Unified Payments Interface), and curating product selections that resonate with Indian buyers. Additionally, Amazon has strategically enhanced its logistics and delivery networks, ensuring its reach extends even to India's most remote areas.

Amazon's dedication to innovation in the Indian market is evident through its continuous introduction of new services and features, such as Amazon Prime, which was launched in India in 2016. Since then, Prime has become a key element of Amazon's strategy, offering perks like free and fast delivery, exclusive access to special deals and a vast library of digital content, all of which have been instrumental in fostering customer loyalty and encouraging repeat purchases.

### Flipkart

Established in October 2007 by Sachin Bansal and Binny Bansal, both of whom already worked at Amazon, Flipkart at first propelled as an online bookshop. It quickly expanded its product offerings, evolving into India's leading e-commerce platform. The company's early success can be attributed to its keen understanding of the Indian market, particularly the unique challenges associated with logistics, payment options and establishing consumer trust.

During its initial years, Flipkart concentrated on building a robust supply chain and logistics infrastructure, recognising that the lack of reliable delivery systems was a major obstacle to the growth of e-commerce in India. To address this, Flipkart created its own logistics arm, Ekart, which became instrumental in ensuring prompt and dependable deliveries. Additionally, Flipkart pioneered the cash-on-delivery payment method, which helped alleviate concerns among Indian consumers who were reluctant to pay online before receiving their purchases.

As the company grew, Flipkart expanded its range of product categories, introduced new services and made advancements in areas like customer service, return policies and refund processes. Its deep understanding of Indian consumer needs and ability to adapt quickly to market changes allowed Flipkart to build a loyal customer base and establish itself as a household name in India.

In 2018, Flipkart's position in the Indian market was further solidified when Walmart acquired a 77% stake in the company for $16 billion. This acquisition, the largest e-commerce deal globally at the time, underscored the importance of the Indian market on the global stage. Walmart's involvement provided Flipkart with additional financial resources and strategic support, enabling it to compete more effectively with Amazon.

Since the acquisition, Flipkart has continued to innovate, focusing on enhancing its omni-channel capabilities, expanding its product offerings and strengthening customer engagement through loyalty programmes and personalised shopping experiences. The company has also made significant strides in merging offline retail with online platforms, understanding the importance of catering to Indian consumers who prefer a hybrid shopping experience.

## Pricing Strategies

### Amazon's Dynamic Pricing

Amazon employs a sophisticated dynamic pricing strategy that allows it to adjust prices in real time based on factors like demand, competition and customer behaviour. This approach, powered by advanced algorithms and extensive data, helps Amazon maximise sales and profitability.

In the price-sensitive Indian market, this strategy provides Amazon with a competitive edge by frequently updating prices to stay ahead of competitors. For example, during major sales events like the Great Indian Festival, Amazon may lower prices on popular items to attract more customers while raising prices on less sought-after products to maintain profits.

Dynamic pricing also personalises the shopping experience by offering targeted discounts based on individual customer preferences, increasing the chances of purchase. Additionally, this strategy allows Amazon to quickly respond to market trends and clear out slow-moving inventory by adjusting prices accordingly, ensuring efficient stock management and sustained profitability.

### Flipkart's Discount-Driven Approach

Flipkart's pricing strategy is primarily based on aggressive discounting, a tactic that has been central since the company's inception. This is notably seen during major sales events such as the Big Billion Days, where significant discounts draw a large customer base, especially in the more price-sensitive Tier 2 and Tier 3 cities in India.

The strategy aims not just to reduce prices but also to create a sense of urgency with limited-time deals and flash sales, using scarcity and FOMO to prompt fast buying decisions. This approach proves particularly effective during festive periods like Diwali.

Additionally, Flipkart offers discounts through various promotional campaigns, bank collaborations and cashback deals, supported by marketing that highlights savings. Loyal customers receive personalised discounts, boosting repeat purchases.

The focus on driving high sales volumes enables Flipkart to negotiate better terms with suppliers, allowing for lower prices while maintaining margins. This is especially noticeable in high-volume categories such as electronics and fashion. Moreover, the discount-driven model helps Flipkart expand into smaller towns and rural areas by providing affordable options, no-cost EMI and simple returns.

While effective, this discounting strategy presents challenges in terms of profitability and managing customer expectations for ongoing discounts. Flipkart addresses these challenges by diversifying its revenue streams through advertising, fintech services and subscription models like Flipkart Plus.

## Promotional Campaigns

### Amazon's Prime Membership and Exclusive Offers

Since its 2016 launch in India, Amazon Prime has been crucial to Amazon's marketing, building a loyal customer base with benefits like free shipping, early sale access and exclusive deals.

A key aspect of Prime is its integration with Prime Video, offering a broad range of entertainment that appeals to the growing digital content audience in India, including regional content for diverse users.

Amazon promotes Prime through online ads, social media and telecom partnerships, using tactics such as discounted memberships and free trials, particularly around Prime Day. This event, with its deep discounts and exclusive offers, drives membership and sales.

To appeal to cost-conscious Indian consumers, Amazon introduced a lower-priced monthly subscription, fuelling significant subscriber growth and making India a major market for Prime. The combination of shopping benefits and entertainment enhances customer satisfaction and loyalty, leading to increased spending among Prime members.

### Flipkart's Big Billion Days Sale

Flipkart's Big Billion Days (BBD) sale, launched in 2014, is a major shopping event in India known for significant discounts and exclusive launches. Held annually during Diwali, it leverages the festive season for substantial consumer spending.

Flipkart heavily promotes BBD through TV ads, online campaigns, social media and influencer collaborations, offering exclusive deals and deep discounts through partnerships with top brands.

Promotional strategies include flash sales, early-bird offers, countdowns and personalised recommendations

to create urgency. Payment options like no-cost EMI and cashback make high-value items more affordable.

The Flipkart Plus loyalty programme offers early access and extra discounts, enhancing customer engagement. Additionally, Flipkart customises its marketing for regional markets, catering to local tastes and languages.

The BBD sale repeatedly breaks sales records, boosting Flipkart's revenue and reinforcing its brand presence, especially in competition with Amazon during the festive season.

## Digital Marketing and Advertising

### Amazon's SEO and SEM Tactics

Amazon's strong presence in the Indian e-commerce market is significantly bolstered by its strategic implementation of SEO and SEM. These techniques are crucial for attracting traffic and maintaining high visibility.

The company's SEO strategy focuses on optimising product listings with relevant keywords, comprehensive descriptions and customer reviews to enhance their ranking on Google, which is particularly important in India, where many begin their searches on this search engine.

Amazon also heavily invests in SEM, utilising Google Ads to bid on valuable keywords and secure prominent ad placements. This dual approach is supported by surveys indicating that a large number of users find products through Google.

Furthermore, Amazon employs retargeting ads to engage users who visited the site but did not purchase, showing them personalised ads on other websites to drive them back for a transaction.

The company's data-driven approach continuously improves its SEO and SEM strategies, allowing it to adapt to market trends and consumer behaviour effectively, ensuring its digital marketing remains impactful.

### Flipkart's Social Media and Influencer Marketing

Flipkart has built a strong social media presence to engage with India's younger audience. The company uses platforms like Facebook, Instagram, Twitter and YouTube to share engaging content, including promotions, product highlights and interactive posts such as contests and polls, which help in boosting brand loyalty and gathering customer insights.

A key element of Flipkart's strategy is influencer marketing. Collaborations with influencers on Instagram and YouTube feature genuine content like unboxings and reviews, which are viewed as more credible than traditional advertising.

Surveys indicate that social media promotions and influencer endorsements strongly influence younger users, highlighting the importance of these strategies for Flipkart. The company also adapts its content to current trends and events, like festive seasons, to stay relevant.

Furthermore, Flipkart uses targeted paid ads on social media to reach specific audiences, enhancing traffic and sales. Overall, these social media and influencer tactics effectively engage customers and strengthen brand loyalty.

## Customer Engagement and Loyalty Programmes

### Amazon's Customer-Centric Approach

Amazon's strong performance in the Indian e-commerce market is due to its dedication to customer satisfaction and effective use of personalised recommendations. The company's focus on exceptional service includes 24/7 support, a user-friendly help centre and a seamless returns and refunds process, which customers find advantageous compared to competitors.

Amazon uses advanced data analytics to tailor product recommendations based on user behaviour, enhancing the shopping experience and boosting repeat purchases. The Amazon Prime programme further supports customer loyalty by offering benefits like exclusive content and early sale access, increasing engagement and spending among members.

Additionally, Amazon actively seeks customer feedback through surveys and reviews to refine its services and products, ensuring that customers feel valued and maintaining their loyalty.

### Flipkart's Game-Based Loyalty Programmes

Flipkart's SuperCoins, part of Flipkart Plus, has transformed customer engagement by rewarding purchases with points redeemable for discounts, gift cards and exclusive offers. The programme's gamified approach makes shopping more engaging, encouraging frequent purchases through features like challenges and bonus coins.

Popular with younger customers, SuperCoins enhances loyalty by integrating with services like food delivery and streaming subscriptions, adding extra value. Flipkart also uses SuperCoins to boost sales and promote products during events like the Big Billion Days, enhancing customer interaction and retention.

## Competitive Strategies and Market Positioning

### Amazon's Strategic Partnerships and Acquisitions

Amazon has strengthened its position in India's e-commerce sector through strategic partnerships and acquisitions, especially in competitive areas like grocery. These moves have broadened Amazon's market presence and improved its localised shopping experience.

One major strategy is the "Amazon Easy" programme, which partners with local retailers to serve as pick-up points, enhancing accessibility in Tier 2 and Tier 3 cities and building consumer trust through familiar local businesses. Survey data shows this approach increases trust in Amazon.

Another significant step was acquiring BigBasket in 2021, expanding Amazon's reach in the grocery sector. BigBasket's delivery network and product range boost Amazon's capability to offer reliable grocery services and a wider selection of fresh produce, strengthening its position against competitors.

Amazon also invests in Indian tech startups, such as BankBazaar, to enhance its payment ecosystem and customer security. These strategic investments and partnerships are part of Amazon's strategy to provide a comprehensive shopping experience, integrating online and offline elements to maintain a competitive edge.

### Flipkart's Omni-Channel Approach

Flipkart's omni-channel strategy merges online convenience with offline experiences to address diverse shopping preferences in India. Recognising that many consumers value both digital and tactile shopping experiences, Flipkart has integrated its online platform with physical retail through programmes like "Flipkart Wholesale" and "Flipkart Quick." These initiatives allow customers to order online and either pick up from nearby stores or receive swift delivery from local partners, benefiting both Flipkart and local SMEs.

The "Flipkart Smart Stores" concept further enhances this strategy by letting customers try products in-store and then order online, often with fast delivery options. Flipkart also uses technology, such as QR codes, to enrich the in-store experience with digital information and offers.

The SuperCoins loyalty programme, applicable for both online and offline purchases, strengthens customer engagement by providing consistent rewards across channels. This hybrid model is particularly effective in Tier 2 and Tier 3 cities, where Flipkart is expanding its presence by combining e-commerce with traditional retail.

Overall, Flipkart's omni-channel approach effectively caters to varied consumer preferences, enhancing satisfaction and broadening its market reach.

## Corporate Social Responsibility

### Amazon

Amazon is actively working to reduce its environmental impact by investing in renewable energy sources such as solar and wind power. They are also making efforts to improve their packaging to be more environmentally friendly, with the goal of reducing waste and emissions.

In terms of supporting communities, Amazon believes in giving back to the areas where it operates. They assist local businesses by providing them with opportunities to sell on their platform. Additionally, they invest in projects related to affordable housing and offer aid during times of disasters.

Amazon places a strong emphasis on diversity and inclusion within its workforce, particularly in fields like

engineering where certain groups are under-represented. They have initiatives like the "Amazon Women in Engineering" programme aimed at promoting diversity and narrowing these gaps.

Regarding education, Amazon is committed to promoting learning in STEM fields. Through their "Amazon Future Engineer" programme, they provide resources and support to schools and students to encourage skill development in science, technology, engineering and mathematics.

Lastly, Amazon's corporate social responsibility efforts have a global reach, as seen in their participation in projects like the "Amazon Solar Farm U.S. East," which contributes to renewable energy production on a larger scale.

### Flipkart

Flipkart Wholesale's CSR policy centres on education, environmental sustainability and community welfare. They emphasise initiatives like digital education, skill development, environmental conservation and supporting local communities. For instance, they've partnered with NGOs for digital literacy programmes, invested in renewable energy and promoted waste reduction and recycling.

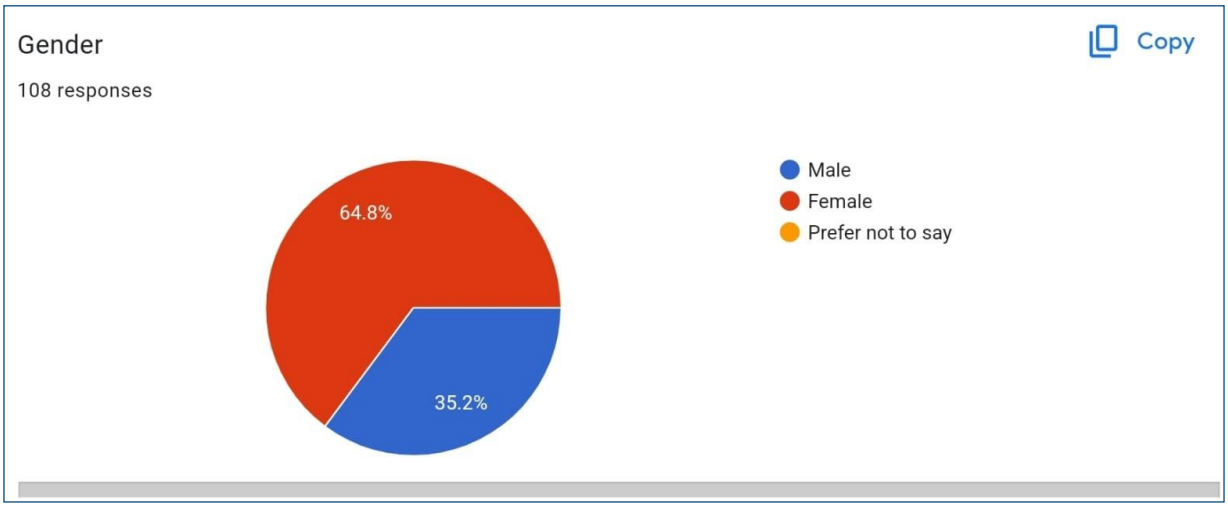
Additionally, they focus on employee engagement through volunteering and encourage suppliers to adopt sustainable practices. Overall, their CSR efforts align with the UN Sustainable Development Goals, demonstrating a commitment to creating positive social and environmental impacts.

## Analysing Consumer Choice (Through Online Survey)

After evaluating the market performance of Flipkart and Amazon, this research discovered that both companies are engaged in fierce competition concerning their services, promotions, product selections and overall customer satisfaction. While Amazon holds the top position and Flipkart follows in second place among e-commerce platforms in India, their commitment to providing excellent services makes it challenging to pinpoint a clear leader from the consumers' perspective. To gain insights from customers, we opted to conduct an online survey.

We implemented an online survey to investigate consumer preferences between Amazon and Flipkart in my local area. The primary objective was to determine whether consumers had a preference for one platform over the other or if there was an equitable preference for both. By carefully selecting the sample size, this research aimed to collect a representative overview of consumer opinions and purchasing behaviours in the local market. This study provides important insights into the competitive dynamics of e-commerce within our community.

Given below is the graphical representation of results of survey:



Age

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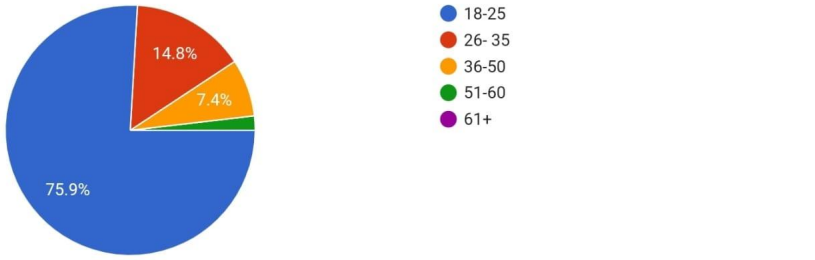


Occupation

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Annual household income

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98 responses


How often do you shop online?

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Which platform do you prefer for online shopping?

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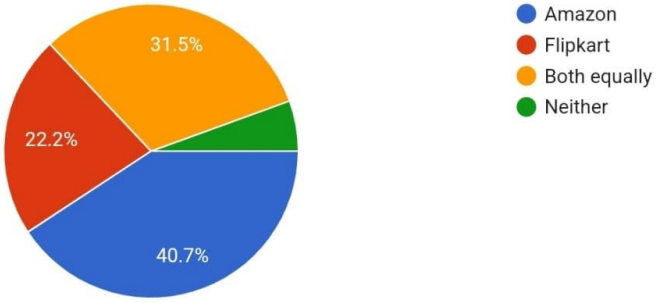


What factors influence your decision when choosing between Amazon and Flipkart?

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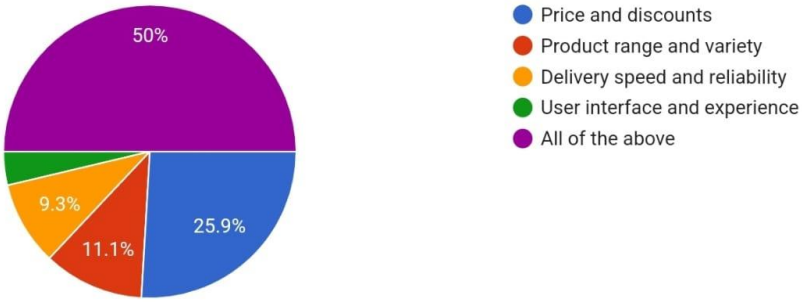


How satisfied are you with the user interface and experience on Amazon and Flipkart?

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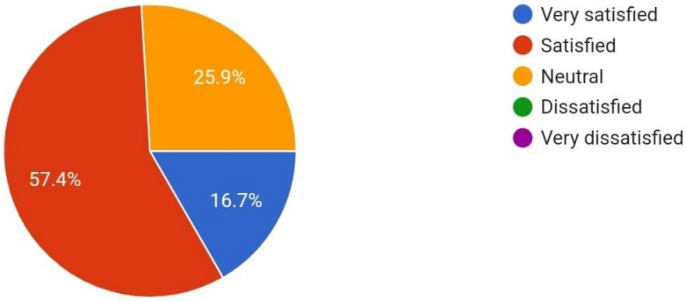

Which platform offers better deals and discounts in your opinion?

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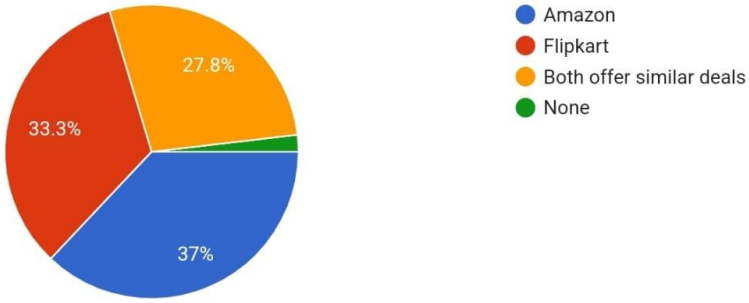


How would you rate the delivery speed and reliability of Amazon and Flipkart?

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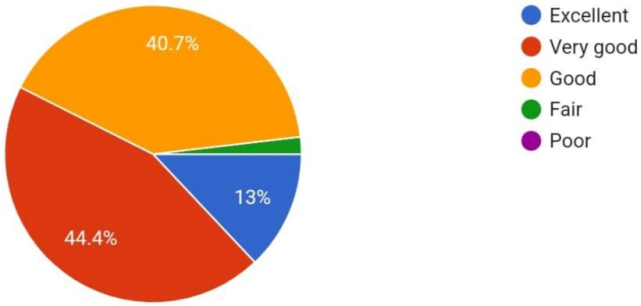


Do you find the product range and variety better on Amazon or Flipkart?

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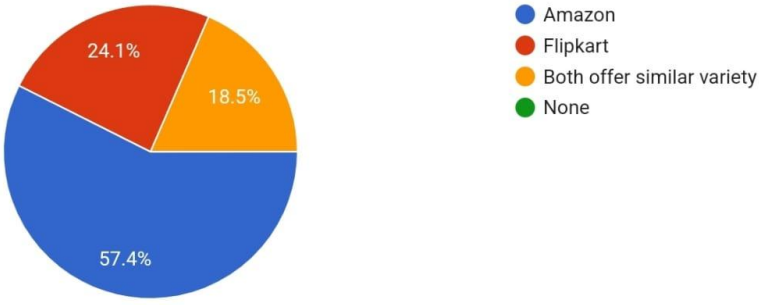

How responsive and helpful is customer service on Amazon and Flipkart?

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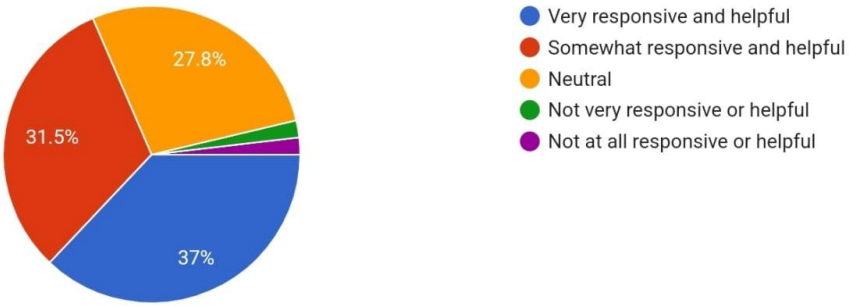


Have you ever encountered any issues with product quality or authenticity on either platform?

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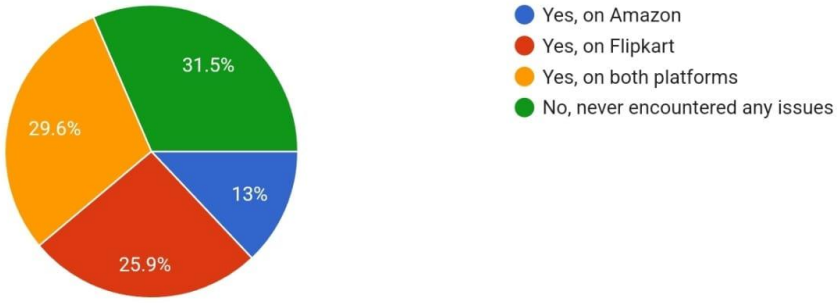


Overall, which platform would you recommend to friends and family?

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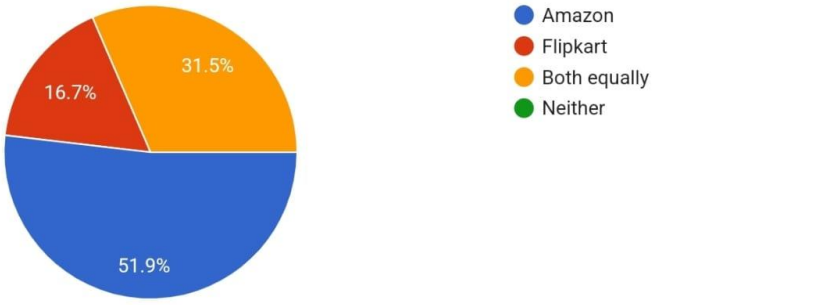

In the survey, 108 participants shared their views. Following the investigation, it became evident that individuals appreciate the deals and discounts as well as the range and variety offered by the platform. Specifically, 37% of respondents believe that Amazon provides excellent deals and discounts, while 33.3% think Flipkart offers better ones and 27.8% believe both platforms offer similar deals. Regarding range and variety, 57.4% prefer Amazon, 24.1% favour Flipkart and 18.5% find both equally appealing. Lastly, in terms of recommending a platform to friends and family, 51.9% suggested Amazon, 16.7% recommended Flipkart and 31.5% endorsed both platforms equally.

A Z-test was conducted on the survey data to statistically evaluate the differences in consumer preferences between Amazon and Flipkart, providing clarity on which platform is more favoured by consumers. Step-by-step conduction of Z-test is as follows:

## Step-1: Formulate the Hypotheses

- *Null Hypothesis ($H_0$):* $p_1 = p_2$ (There is no significant difference in consumer preference between Amazon and Flipkart).
- *Alternative Hypothesis ($H_1$):* $p_1 \neq p_2$ (There is a significant difference in consumer preference).

Where $p_1$ is the proportion of participants recommending Amazon and $p_2$ is the proportion recommending Flipkart.

## Step-2: Calculate the Sample Proportions

From the data collected:

- Amazon: 51.9%
- Flipkart: 16.7%
- Both: 31.5%

Excluding those who recommended both platforms, we need the effective sample size for those who recommended either Amazon or Flipkart.

Effective sample size $n = 108 \times (1-0.315) = 73.98 \approx 74$

Number recommending Amazon $x_1 = 108 \times 0.519 \approx 56$

Number recommending Flipkart $x_2 = 108 \times 0.167 \approx 18$

So, the proportions are:

- $\hat{p}_1 = \frac{56}{74}$
- $\hat{p}_2 = \frac{18}{74}$

## Step-3: Calculate the Pooled Proportion

$$p = \frac{x_{1+}\ x_2}{n_1 + n_2} = \frac{56+18}{74+74}$$

## Step-4: Calculate the Standard Error

$$SE = \sqrt{\sqrt{\hat{p}} \times (1-\hat{p}) \times \left(\frac{1}{n_1} + \frac{1}{n_2}\right)}$$

## Step-5: Calculate the Z-Score

$$Z = \frac{(\hat{p}_1 - \hat{p}_2)}{SE}$$

## Step-6: Determine the P-Value

Using the standard normal distribution.

Let's compute these values step-by-step using Python.

## Results of the Z-Test

- Effective Sample Size (excluding both recommendations): 74
- Number recommending Amazon: 56
- Number recommending Flipkart: 18
- Proportion recommending Amazon ($p_1$): 0.757
- Proportion recommending Flipkart ($p_2$): 0.243
- Pooled Proportion $(\hat{p})$: 0.5
- Standard Error ($SE$): 0.0822
- Z-Score: 6.247
- P-Value: $4.18 \times 10^{-10}$

## Interpretation

- *Z-Score (6.247):* This is a very high value, indicating a large difference between the proportions of participants recommending Amazon versus Flipkart.

- *P-Value (4.18×):* This is much less than the typical significance level of 0.05, indicating that we can reject the null hypothesis with high confidence.

Given the results of the Z-test, we reject the null hypothesis ($H_0$) and accept the alternative hypothesis ($H_1$). This means there is a significant difference in consumer preference between Amazon and Flipkart, with a clear preference for Amazon among the respondents in your survey.

Consequently, it's evident that Amazon has emerged as the preferred choice among consumers in the market.

## Conclusion

Based on the research findings, it can be concluded that Amazon and Flipkart have established themselves as dominant players in the Indian e-commerce market through their comprehensive marketing strategies. Despite both companies having strong brand identities and effective marketing initiatives, the analysis reveals that Amazon emerges as the preferred choice among consumers based on the online survey results. Additionally, both companies exhibit a commitment to corporate social responsibility, further enhancing their image among consumers. As e-commerce continues to evolve in India, understanding and leveraging effective marketing strategies will remain crucial for sustained success in this competitive landscape.

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# Predictors of Travel Intermediaries' Inclination Towards E-Commerce: Integrating UTAUT-1 and E-Readiness

**Reyaz Ahmed Qureshi*, Muneer Ahmad Kashkari**, Mudasir Ahmad Mir*****

**Abstract**

The tourism sector is currently undergoing a tremendous shift based on technology. The advantages of e-commerce have led to expansion across several commercial sectors, including the tourist industry. E-commerce offers a welcoming environment for travel firms to compete better, which may also have a positive influence overall. The study proposes an extended UTAUT model to investigate the behavioural intention of travel intermediaries towards e-commerce adoption. A sample of 203 travel agencies and tour operators was chosen for the study using a questionnaire as a data collection instrument. Structural Equation Modelling was applied to analyse and test the relationship of the variables. Findings reveal that facilitating conditions have an important influence on predicting e-commerce adoption among the travel agents and tour operators. Findings highlight E-readiness as the least important predictor of travel intermediaries' willingness to adopt e-commerce.

**Keywords:** Travel Intermediaries, Technology, E-Commerce, UTAUT, Business

## Introduction

Over the recent decades, humans have employed technology to respond to challenging circumstances. The global economy and nearly every element of human existence have undergone a dramatic transformation as a result of a technological revolution (Kasem & Hassanein, 2014). All sectors are seeing growth and expansion in technology. Similar to how technology is influencing other industries, tourism is developing around information technology that contributes plenty to the tourism industry (Khatri, 2019), and its adoption is mostly used to govern operational functions in the tourism business. As contemporary technology has developed, the whole tourist industry has undergone several changes that are seen in both the demand for and provision of services (Januszewska et al., 2015). The internet revolution created many possibilities and difficulties. In this new high-tech world, e-business empowerment is crucial for an organisation's success, especially in the leisure and tourism sector, given its advantages in scalability and marketing advantage (Bandara & Silva, 2016). The advantages of e-commerce have led to expansion across several commercial sectors, including the tourist industry. Since the tourist business is a service-based industry, e-commerce may help it to improve its offerings. The performance of many various industries, including the tourist sector, might be influenced by e-commerce (Salwani et al., 2009).

The travel business is the best depiction of a field where information technology has had a substantial impact (Warden & Tunzelana, 2004). Travel agencies and tourism providers compete for a sizable client base as a result of the internet's transformation of the industry's distribution channels (Nevmerzhitskaya, 2013). Within the ever-changing environment of the travel sector, the utilisation of e-commerce platforms by travel agents has grown significantly important for their ability to compete and endure in the field (Mishra & Gupta, 2020). Travel intermediaries, like travel agencies and tour operators, play a crucial role as links connecting travellers to service

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providers, making transactions easier and improving the overall travel experience (Gretzel et al., 2015).

As stated by Buhalis (1998), travel intermediaries are recognised as one of the pillars of the tourism industry because of their vital roles as facilitators between clients and suppliers. These intermediaries serve as a bridge between clients and providers of travel services (Dolnicar & Laesser, 2007). By making affordable distribution methods available via the use of e-commerce and ICT, travel intermediaries' roles become redundant, reducing them to mere intermediaries who are viewed as superfluous (Cazares, 2016). Travel agencies view disintermediation, direct booking with suppliers and re-intermediation via the Internet or mobile phones as threats. Online travel agencies give customers all the advantages, such as custom offers that aren't available through the conventional route, assisting the business as a whole in expanding in terms of both sales and value. According to Garkavenko et al. (2010), for an organisation to succeed, its ability to integrate into the market will largely depend on its ability to comprehend and implement ICTs, which enable businesses to better contact their target consumer base and increase operational efficiency. Even while small companies are vital to the economies of developing nations, there are valid worries about ICT adoption, particularly e-commerce. E-commerce strives to improve the inter- and intra-connectivity of tourism companies by leveraging technological innovation, therefore improving the interaction between tourism firms and facilitating information transmission. From the current level of tourism growth, the introduction of e-commerce is proven to be beneficial and constructive; however, it is important to stress that, despite the potential benefits, the impact of e-commerce emergence on the industry is quite minor. Furthermore, it is critical to recognise that the domestic tourist sector of poor countries has not yet completely realised the potential of tourism e-commerce (Zhang & Gui-Pei, 2008). Despite the recognised significance of integrating e-commerce, numerous travel intermediaries face obstacles in fully embracing digital platforms. Factors such as organisational inertia and the perceived complexity of technology persist in hindering widespread adoption (Henama & Alpeni, 2020). The majority of previous research has addressed the function of numerous influencing elements when studying technology adoption processes in diverse contexts and geographical regions. Despite this, there is a dearth of literature on e-commerce acceptance in the tourism businesses in developing regions. Therefore, it is imperative to comprehend the behavioural inclinations of travel intermediaries towards e-commerce. This understanding is crucial for formulating successful strategies aimed at fostering technological incorporation and improving the competitiveness of the industry.

UTAUT model i.e., 'Unified Theory of Acceptance and Use of Technology', has developed as a major research framework in the field of technology adoption. This model has been recognised by scholars and is regarded as giving a more comprehensive explanation of technology acceptance and is recognised as one of the most parsimonious behavioural theories than other models currently in use (Altalhi, 2021). In addition to UTAUT-1, the idea of e-readiness involves both the preparedness of organisations and individuals to adopt and efficiently utilise electronic technologies (Soomro et al., 2020). Drawing upon the theoretical foundations of UTAUT-1 and e-readiness, the primary objective of this research is to examine the determinants that impact the behavioural inclination of travel intermediaries in embracing e-commerce. Through a thorough analysis of these determinants, the study endeavours to offer practical recommendations to key players in the industry, policymaker and technology providers, with the ultimate goal of promoting the widespread acceptance of e-commerce platforms within the travel sector and facilitating sustainable development.

## Literature Review and Hypotheses Development

Before e-commerce, only larger firms could go global. The use of e-commerce business models opens up a plethora of lucrative opportunities for worldwide manufacturers and service companies and online retailing is currently a desirable and affordable way for start-ups or smaller businesses to acquire new clients (Malhotra & Malhotra 2006). Not all firms employ e-commerce; some steer clear of it altogether. According to Sumner and Klepper (1998), some organisations choose to use a small portion of the current IT infrastructure before gradually expanding their information technology-based expertise.

The tourism sector is currently undergoing a tremendous shift based on technology. According to Carlisle et al. (2023), the shift is characterised by the induction of

online reservation systems and GDSs. In most developing countries, the comprehensive implementation of IT-based tourism platforms continues to be incomplete (Rahman, 2021). Due to their crucial role as middlemen in the service delivery process, tour operators and travel agencies have met a range of problems as a result of this technology. The extra six P's of the tourist marketing mix-physical evidence, people, partnerships, packaging, programming and processes underline the necessity for information systems as a marketing tool for tour operators and travel agencies (Mill & Morrison, 2002).

The UTAUT model proposed that performance expectancy, effort expectancy, social influence and facilitating conditions are the main variables that affect a person's behavioural intention. These four key factors are crucial in influencing attitudes towards adopting a certain technology or innovation. The model demonstrated to have a high degree of explanatory power of 70% when evaluated using empirical data (Venkatesh et al., 2003). Since its inception, the model has seen widespread application (Alzahrani & Goodwin, 2012).

## Performance Expectancy

According to Gupta and Dogra (2017), performance expectancy can be described in terms of a variety of things, such as usefulness, convenience, time savings and productivity. Venkatesh et al. (2003) defined it as the extent to which a person's confidence in applying a given skill enhances work rendition i.e., an individual will have the expectation that their performance will be significantly improved using a certain technology or part of it. Since users place a high value on a strong use-execution relationship, Performance Expectancy has a major influence on e-commerce adoption (Agarwal & Karahanna, 2000). Performance outcomes are exclusively focused on work-related outcomes. Performance expectancy was also identified as a key indicator of technology adoption in earlier research (Ayeh et al., 2013). Therefore, the following hypothesis is proposed.

*H1: Performance expectancy exerts a significant influence on behavioural intention of travel intermediaries to adopt e-commerce.*

## Effort Expectancy

Effort expectancy is an important factor for both the TAM Model and the UTAUT model because it affects whether people intend to adopt new technologies or not. The degree of ease with which people can utilise a particular technology is referred to as effort expectancy. Curtis et al. (2010), also defined it as the level of effortlessness involved in technology adoption, which influences user intentions. Harindranath et al. (2008), assert that it is essential to utilise this specific element efficiently if a business wants to design a user-friendly system. Several researchers have backed the empirical link between effort expectancy and behavioural intention (Venkatesh et al., 2012; Abu-Shanab & Pearson, 2007). In keeping with this, we propose:

*H2: Effort expectancy significantly impacts the behavioural intention of travel intermediaries to adopt e-commerce.*

## Social Influence

It is the idea of adjusting to change while taking into account what other people think is important. According to Harindranath et al. (2008), social influence depends on how behaviours related to technology use are evaluated. According to Dwivedi et al. (2011), the three notions in SMEs—subjective norms, image and social factors—are what this theory relies on. Each of the aforementioned elements affects how individuals behave at work and how they react to the social atmosphere there. Outside forces like friends, co-workers, family, or media like the internet can motivate people to adopt tech-based innovations (Eckhardt et al., 2010). Some antithetical results could be found in the previous literature on how social influence affects behavioural intentions. According to Lian and Yen (2014), social influence plays an important role in people's intention to adopt new technologies, whereas Shin (2009) found no proof to favour the relationship between social impact and behavioural intention. As a result, we propose:

*H3: Social influence has a significant impact on behavioural intention of travel intermediaries to adopt e-commerce.*

## Facilitating Conditions

The concept of facilitating conditions refers to how users view the information and tools at their disposal to employ them in their daily routines (Venkatesh et al., 2003). It was defined as the extent of the technological and

organisational infrastructure necessary for a technology-based system (Thomas et al., 2013). It is an environment where administrative and technological setups have been made to make use of the system easier (Eweoya et al., 2016). The facilitating condition has the propensity to mould employee behaviour favourably and is crucial to comprehending the acceptance and implementation of contemporary technology. Therefore, people are unlikely to adopt e-commerce if not given the required resources and the knowledge that goes along with it. Therefore, we hypothesise that:

*H4: The presence of facilitating conditions exerts significant effect on behavioural intention of travel intermediaries to adopt e-commerce.*

## E-Readiness

E-readiness is a variable that assesses how a business considers the role of existing levels of technological infrastructure and know-how in e-commerce adoption. e-commerce adoption and executives' opinions about it can both be directly influenced by the amount of organisational e-readiness (Brdesee, 2013). E-readiness is defined as the capacity to engage in 'e-business and e-commerce' (Parker, 2000). It can also be characterised as an economy's ability to convert existing enterprises into new ones, as evidenced by the ability to conduct real-time economic transactions in any format, anywhere and at any time (Bui et al., 2002). It is argued here that the concept of e-readiness in developing regions opens up new avenues for understanding global e-commerce acceptance and assimilation. Selim, (2008) discovered findings that indicate that e-readiness relies on establishing e-commerce adoption at the administrative and societal levels. E-readiness frameworks serve as key tools for determining whether a country or business is ready to fully capitalise on the opportunities provided by e-commerce (Hartman et al., 2001; Dutta et al., 2004; Oxley & Yeung, 2001).

*H5: E-readiness exerts a significant influence on the behavioural intention of travel intermediaries to adopt e-commerce.*

## Behavioural Intention

It is frequently believed that behavioural intention predicts actual behaviour. According to Kwok and Gao (2005), positive intentions towards a behaviour increase the likelihood that someone will engage in it, and vice versa. It is defined as "the person's perceived likelihood that he or she will undertake the in-concern behaviour." According to Venkatesh et al. (2003), behavioural intent is a direct response variable that determines behavioural usage.

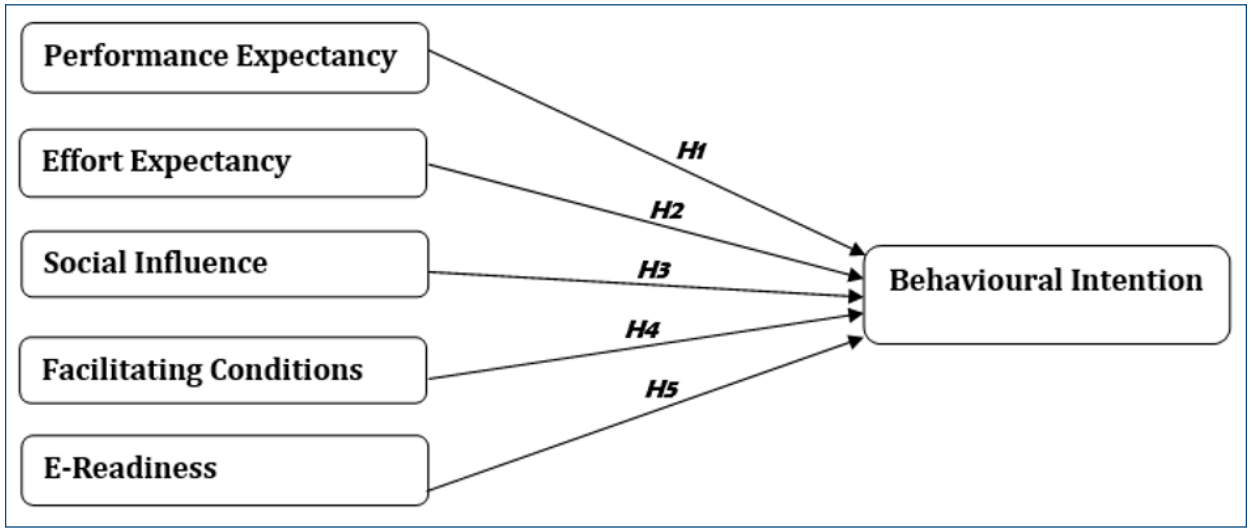


**Fig. 1: Conceptual Model**

## Research Methodology

### Instrument, Sampling and Pilot Test

A quantitative approach to investigation was taken to fulfil the objectives of the study. Using a structured questionnaire, the primary data was collected to assess the influence of the extended UTAUT model on e-commerce adoption. The area of study was Kashmir division of Jammu & Kashmir Union Territory, and data was collected from officially registered travel and tour businesses. An online questionnaire was used to acquire the data. The questionnaire was divided into two parts. The first part addressed the respondents' demographic data i.e., age, gender, education and tenure of business (years of experience). The questionnaire's second section contained 23 statements on a 5-point Likert scale, from 1 to 5, where "1" denoted "Strongly disagree" and "5" denoted "Strongly agree." The scale is comprised of six (06) first-order reflective constructs i.e., 'Performance Expectancy', 'Effort Expectancy', 'Social Influence' and 'Facilitating Conditions' derived from (Venkatesh et al., 2003) and 'e-Readiness' taken from (Molla & Licker, 2005) all five acting as exogenous variables and last one i.e., 'Behavioural Intention' from (Venkatesh et al., 2003) as an endogenous variable.

The sample was selected using a purposive sampling technique. In total, 203 responses were recorded and received for analysis in the research study. Respondents in this survey included members of prestigious tourism organisations, i.e., the Adventure Tour Operators Association of Kashmir, the Travel Agents Association of Kashmir and the Travel Agents Society of Kashmir. The instrument underwent an initial pre-test by a group of nine scholarly researchers, four distinguished faculty members and seven seasoned industry specialists to capture the basic essence of the study. Following pre-testing, 25 people who took part in the pilot study were given the questionnaire to assess the reliability of the research instrument. All constructs were determined to be capable of reaching the suggested threshold of 0.70, indicating a suitable degree of reliability (Nunnally, 1978).

## Data Analysis and Results

### Demographic Statistics

A total of (N) = 203 travel agents and tour operators were part of the sample in the research. The respondents consisted of 82.8% males and 17.2 % females (see Table 1). The majority of respondents 38.4%, belonged to the 18–30 age range, with 36.1% to the 31–40 age range, 18.2% in the 41–50 age group and 7.3% aged 50 or above. Of the participants, 52.2% said they had completed their undergraduate degrees, while 28.6% said they had postgraduate degrees. A further 19.2% of individuals claimed to have finished their secondary education, or 10+2. According to the survey results, a sizable portion of participants—48.3% reported having an experience that lasted between 6 and 10 years. A significant portion of respondents—26.6% have experience ranging from 11 to 15 years. In addition, 19.7% of respondents have 1–5 years of professional experience, while 5.4% have more than fifteen years of experience.

**Table 1: Demographic Profile**

| *Variables* | *Category* | *Frequency* | *%Age* |
|---|---|---|---|
| Gender | Male | 168 | 82.8 |
| | Female | 35 | 17.2 |
| Age (Years) | 18-30 | 78 | 38.4 |
| | 31-40 | 73 | 36.1 |
| | 41-50 | 37 | 18.2 |
| | 50+ | 15 | 7.3 |
| Education | 10+2 | 39 | 19.2 |
| | UG | 106 | 52.2 |
| | PG | 58 | 28.6 |
| Tenure of Business (in yrs.) | 1-5 | 40 | 19.7 |
| | 6-10 | 98 | 48.3 |
| | 11-15 | 54 | 26.6 |
| | 15+ | 11 | 5.4 |
| | | N = 203 | |

Data screening is a crucial step in the first stage of data analysis that must be taken before any subsequent

multivariate analysis. The appropriate examination of data was conducted to identify the presence of any missing values, unresponsive entries, or outliers. Consequently, utilising the statistical package SPSS 26, the complete dataset underwent screening via a frequency analysis, revealing no instances of outliers. The study assessed the unidimensionality of its variables through the employment of the confirmatory factor analysis (CFA) method. Subsequently, the suggested hypotheses were evaluated, and the relationship between the constructs was examined utilising a Structured Equation Model. SPSS was utilised in the analysis to verify the internal consistency and unidimensionality of the variables. Additionally, the CFA findings were imputed, and AMOS was used to evaluate the hypotheses.

## Reliability Statistics

The extended UTAUT scale's reliability study produced a score depicted in (see Table 2). As indicated by Cronbach alpha values that were above the permissible criteria value of 0.7, signify that all the factors in this study demonstrated reliability (Nunnally, 1978; Hair et al., 1998).

**Table 2: Reliability Test**

| *Factor* | *No. of Items* | *α* |
|---|---|---|
| Performance Expectancy | 05 | .976 |
| Effort Expectancy | 04 | .962 |
| Social Influence | 03 | .920 |
| Facilitating conditions | 04 | .969 |
| E-Readiness | 04 | .975 |
| Behavioural Intention | 03 | .953 |
| Total | 23 | .955 |

## Measurement Model

To confirm the constructs and validate the study's measurement properties, CFA was used. Along with the conventional chi-square values, additional goodness of fit metrics, including the (RFI), (NFI), (GFI), (AGFI) and (RMSEA), were carefully examined to guarantee the precision and reliability of the results. The study was able to achieve robust outcomes with a high level of confidence and rigour by taking a comprehensive approach to evaluate the goodness of fit of the model.

With the dimensions of (X2 = 217.630, df = 215; probability level = .000; CMIN/DF = 1.012; RFI = .961; NFI = .967; GFI = 0.921; AGFI = 0.899 and RMSEA = 0.008), exhibited that data for the model fit and hence a measurement model for extended UTAUT was developed. By the criteria stated by Netemeyer et al. (2003), an assessment of measurement instrument was performed. All of the constructs tested in the model had composite reliability (CR) metrics that were more than the proposed threshold level of 0.60 (Koufteros, 1999). Additionally, every single construct under investigation displayed (AVE) values above the minimal criterion of 0.50 (Fornell & Larcker, 1981). As a result, the metrics produced from CR and AVE testify to the reliability of the measured constructs and their convergent validity as well (see Table 2).

During the calculations to compare the correlations between the constructs and the square roots of AVE, the values of AVE were noticeably bigger than those of the correlations between the constructs. The figures in Table 4 show that this conclusion supports the idea that the investigated constructs have a high level of discriminant validity (Fornell & Larcker, 1981).

**Table 3: CFA Results**

| | *Items* | *Loadings* | *CR* | *AVE* |
|---|---|---|---|---|
| Performance Expectancy (PE) | PE5 | .945 | 0.976 | 0.890 |
| | PE2 | .931 | | |
| | PE4 | .940 | | |
| | PE3 | .938 | | |
| | PE1 | .962 | | |
| Effort Expectancy (EE) | EE4 | .937 | 0.963 | 0.867 |
| | EE1 | .942 | | |
| | EE3 | .937 | | |
| | EE2 | .908 | | |
| Social Influence (SI) | SI3 | .938 | 0.921 | 0.797 |
| | SI1 | .892 | | |
| | SI2 | .845 | | |
| Facilitating Conditions (FC) | FC1 | .947 | 0.969 | 0.886 |
| | FC2 | .921 | | |
| | FC3 | .937 | | |
| | FC4 | .960 | | |
| E-Readiness (ER) | ER3 | .950 | 0.975 | 0.908 |
| | ER1 | .965 | | |
| | ER4 | .960 | | |
| | ER2 | .937 | | |
| Behavioural Intention (BI) | BI3 | .939 | 0.953 | 0.872 |
| | BI1 | .946 | | |
| | BI2 | .916 | | |

**Table 4: Discriminant Validity**

| | *BI* | *PE* | *FC* | *EE* | *ER* | *SI* |
|---|---|---|---|---|---|---|
| BI | **0.934** | | | | | |
| PE | 0.635 | **0.943** | | | | |
| FC | 0.483 | 0.663 | **0.941** | | | |
| EE | 0.543 | 0.674 | 0.613 | **0.931** | | |
| ER | 0.546 | 0.685 | 0.680 | 0.658 | **0.953** | |
| SI | -0.021 | -0.079 | -0.078 | -0.096 | -0.209 | **0.892** |

Note: BI = (Behavioural Intention); PE = (Performance Expectancy); FC = (Facilitating Conditions); EE = (Effort Expectancy); ER = (E-Readiness); SI = (Social Influence).

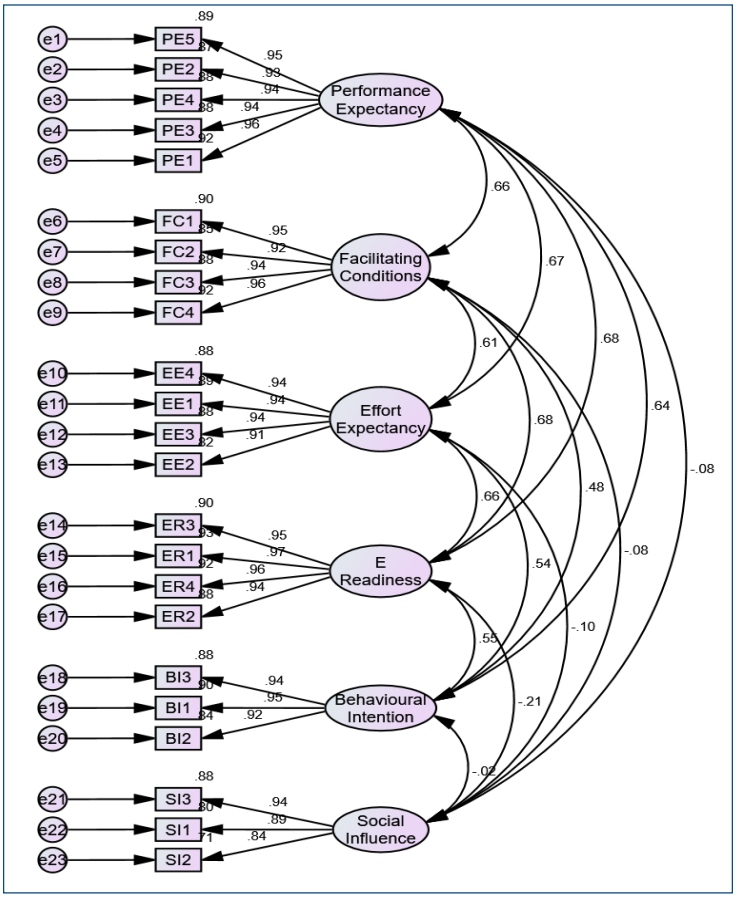


**Fig. 2: CFA Model**

## Hypotheses Testing

Following the completion of confirmatory factor analysis, the next stage involved was the hypothesis testing. The hypotheses were tested through the application of structural equation modelling with the use of AMOS 23 software. The outcomes of the research revealed that performance expectancy plays a vital role in influencing behavioural intention ($\beta = 0.42$; $p < 0.05$). Furthermore, effort expectancy impacts behavioural intention as well ($\beta = 0.39$; $p < 0.05$), and social influence (= 0.34; p 0.05), was also found to be a significant factor in behavioural intention ($\beta = 0.34$; $p < 0.05$). Additionally, the strongest predictor of behavioural intention was discovered to be facilitating conditions ($\beta = 0.49$; $p < 0.05$) and last but not least, the study discovered that e-readiness was substantially correlated with behavioural intention ($\beta = 0.29$; $p < 0.05$). Results of the hypotheses are listed in Table 5; all were supported, and Fig. 3 displays the structural model and the path coefficients.

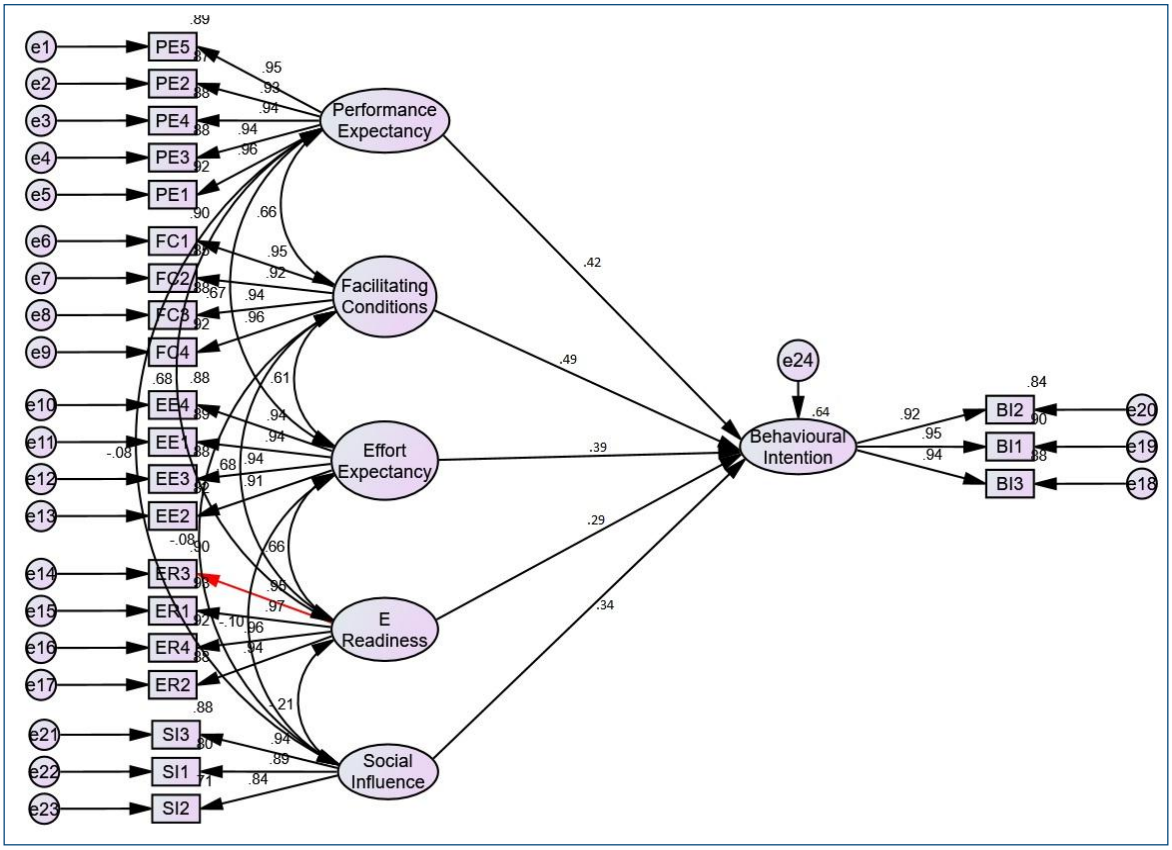


**Fig. 3: Structural Model with Path Coefficients**

**Table 5: Results of Hypotheses**

| *Hypotheses* | | | *Estimate* | *P-Value* | *Results* |
|---|---|---|---|---|---|
| *H1* | Performance Expectancy | Behavioural Intention | **0.42** | *** | Supported |
| *H2* | Effort Expectancy | Behavioural Intention | **0.39** | *** | Supported |
| *H3* | Social Influence | Behavioural Intention | **0.34** | *** | Supported |
| *H4* | Facilitating Conditions | Behavioural Intention | **0.49** | *** | Supported |
| *H5* | E-Readiness | Behavioural Intention | **0.29** | *** | Supported |

Note: - *** Significant at <0.05

## Discussion

Travel intermediaries hold one of the largest proportions of the e-retail market because of the ongoing improvements in travel and tourism-related products. Reputable online travel agencies provide their customers with a wide range of advantages, such as tailored and customised deals that are unavailable through conventional channels. These initiatives have fuelled the industry's expansion in terms of sales, value and competition in particular. E-commerce has experienced growth with the surge of the internet and is expanding at an exceedingly rapid pace due to its positive impact, which includes round-the-clock availability, reduced transaction costs, price comparison and ease of conducting business. E-commerce adoption in the travel industry is a multifaceted process that is driven by several variables. In addition, it is noteworthy that developing regions have paid less attention to this trend. The study utilised the extended UTAUT model by incorporating UTAUT-1 and e-readiness, employing Structural Equation Modelling to analyse the factors that significantly affect travel intermediaries' decision to embrace e-commerce. The findings of the research indicate that performance expectancy, defined as the perceived advantages of utilising e-commerce platforms,

exerts a noteworthy positive impact on the travel intermediaries' behavioural intention to adopt such platforms. This implies that travel intermediaries are more inclined to accept e-commerce solutions when they view them as advantageous in improving their performance and efficiency. Hence, endorsing the findings of Ayeh et al. (2013), which also concluded with performance expectancy as a crucial element in the adoption of technology that enhances the tendency of travel intermediaries to engage in e-commerce. The outcomes also demonstrate that both effort expectancy (perceived ease of use) and social influence (impact of peers and stakeholders) significantly contribute to behavioural intention. Hence, validating the positive association of these two constructs with behavioural intentions (Wang & Shih, 2009; Venkatesh et al., 2012; Lian & Yen, 2014). This indicates that travel intermediaries are still more inclined to adopt e-commerce platforms when they view them as easy to use and when they receive encouragement or endorsement from their social networks. By getting influenced through their social contacts, including peers, industry experts and customers, travel businesses tend to utilise e-commerce solutions more readily to enhance their operations and cater to customer requirements. The positive relationship of these constructs with the behavioural intention remains consistent with findings from previous research (Mapeshoane & Pather, 2016; Dwivedi et al., 2019). However, Shin (2009) had found no association between social influence and behavioural intention. Facilitating conditions, such as organisational backing and technical resources, were found to be the most significant determinant of behavioural intention was found to be the most significant factor in the context of the current study. This finding is contrasting with the results of a study by Dajani (2016), where facilitating conditions were found to be the least significant factor influencing the behavioural intention. This underscores the crucial importance of supportive organisational settings and sufficient resources in promoting the implementation of e-commerce among travel intermediaries i.e., e-commerce expertise and technological and organisational infrastructure remain pivotal to incorporating tech-based operations in travel businesses. Thus, the resources that are crucial to the adoption of ICT and e-commerce remain an important factor in developing regions. The results of our study highlighted the e-readiness as the least significant element in driving travel intermediaries' intention towards e-commerce adoption. There could be several explanations for that. The research data may have been acquired from a subset of travel agents who are already deemed relatively proficient in technology and possess a high degree of e-readiness, characterised by the majority of the chosen sample having already extensively adopted e-commerce, thereby diminishing the impact of e-readiness. It is also plausible that other study variables may have overshadowed the influence of e-readiness on the behavioural intent. The measure of e-readiness employed in this study may have certain limitations or may not encompass certain crucial aspects of technological preparedness that are specific to the travel agency industry. Future research endeavours could contemplate alternative measures or refine the existing e-readiness construct.

## Study Implications

The findings of the study provide important perspectives for individuals working in the travel industry, emphasising the main factors that influence travel intermediaries' inclination towards adopting e-commerce. Companies can utilise these insights to create specific strategies to encourage e-commerce adoption, such as implementing training programs to improve digital skills and fostering a supportive organisational environment. Policymakers and industry groups can utilise the findings to draft policies and projects that promote the use of e-commerce by travel intermediaries. This could involve offering financial incentives for technology investments, encouraging cooperation among industry players and establishing platforms for sharing knowledge to facilitate technology adoption. The study enhances the current body of literature by empirically confirming the impact of different factors on travel intermediaries' behavioural intention towards e-commerce adoption. Overall results implicate that travel businesses should prioritise basic infrastructure and resources while intending to seek the advantages of e-commerce technologies. To further augment the viability of e-commerce technologies, it is crucial to guarantee user-friendliness and make use of social impact.

## Limitations and Future Research

The research solely focused on the Kashmir division within the Union Territory of Jammu & Kashmir, which may restrain the potential of the study to generalise

its findings. The cross-sectional design utilised in the study may constrain its capacity to definitively establish causality or deduce temporal connections among variables. Although the study can unveil associations between variables, it is unable to ascertain the causal direction or determine if alterations in one variable occur before those in another. To obtain more robust evidence of causality, longitudinal or experimental designs might be more suitable. Additionally, to gain a better understanding of the adoption of e-commerce, future research initiatives should explore and refine the e-readiness measures that could specifically be designed for the tourism industry. In order to give an improved understanding, future study might examine other aspects that could affect adoption decisions and can use this extended model in other contexts and can incorporate other variables such as self-efficacy, prior experience and perceived cost to draw more conclusions and enlighten the understanding of the phenomenon.

*Conflict of Interest:* On behalf of all authors, the corresponding author states that there is no conflict of interest.

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# Influence of Environmental Concern and Cultural Biases on the Pro-Environment Behaviour of the Students

**Anuradha***

**Abstract**

While deciding SDG (Sustainable Development Goals), one goal is about responsible production and consumption of resources. It is evident that the way humans are using natural and man-made resources is resulting in its scarcity. Various anthropogenic activities adopted have been contributing to the deteriorating condition of the environment. There are few research available where high environmental concern and knowledge led to more environment protective behaviour and also few failed to prove the same. The present study aims to understand the role of concern for environment and different cultural biases of students studying different course in Meerut on their pro-environment behaviour.

**Keywords:** Pro-Environment Behaviour (PEB), Environmental Concern, Environmental Knowledge, Cultural Biases

## Introduction

The philosophy behind the concept of sustainable development implies giving better and classic future to our coming generations. In contribution, various policies and procedures developed for the sake of advancement and the neglected contribution done by individuals to protect the environment has been studied many times by the researchers (Turaga et al., 2010; Zenelaj, 2013). Anthropogenic activities are considered to be the main reason for many environmental problems out of all, pro-environment behaviour is considered as a major tool to protect the environment (Stern, 2000; Chen et al., 2017).

In 2015, UN established sustainable development goals (SDG), which were about "Life on Land" by showing "Responsible Consumption and Production" one of the SDG to be achieved by 2030. It is considered that to behave in an environmentally friendly manner, people should have a high level of awareness about the deteriorating conditions of the environment. In fact, various behaviour influencing factors should have been identified. There are many behavioural factors exist, which results in the creation of environment awareness, intention to protect the environment and at last environment friendly behaviour. In the same manner, an individual's concern as well as cultural orientation can also be proved dominant factors required to promote environmentally friendly behaviour (Adger et al.; Kollmuss & Agyeman, 2002; Tam & Chan, 2017; Bamberg & Möser, 2007; 2013; Price et al., 2014). Therefore, the present study of pro-environment behaviour will try to investigate the connection between environmental concern and cultural differences to behave pro-environmentally.

## Pro-Environment Behaviour

Pro-environment behaviour is relatively not a new term in the research area. Many researchers have been done to know and understand the behavioural pattern, as it is a complex one to study pro-environment behaviour has been defined differently by different researchers and gave many alternate denominations also.

| *Authors* | *Meaning/Denominations* |
|---|---|
| Kollmuss and Agyeman (2002) | Conscious behavior of any individual for the purpose to minimize the impact cynical impact on the environment of their actions. |
| Lynn (2014) | That behavior which has less impact than an alternate behavior. |
| De Young (2000) | Environmentally responsible behavior. |
| Kaiser (1998) | Ecological-Behavior. |

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| *Authors* | *Meaning/Denominations* |
|---|---|
| Axelord and Lehman (2009) | Environmental actions. |
| Steg and Vlek (2009) | Pro-environment behavior is that which harm the environment in the least possible way infact try to benefit the environment in some or other way. |

## Influencing Factors and Measuring Pro-Environment Behaviour

As earlier stated, various anthropogenic activities are the root cause of many environmental problems existing. So, it becomes essential to know the contributing motivational and influencing factors to behave pro-environmentally.

A long list of literature exist that successfully finds the factors such as various internal and external factors by:

| | |
|---|---|
| Kollmuss and Agyeman (2002) | Influential Factors<br>*Internal Factors:* Motivational level, level of environmental knowledge one is having, values, attitude, awareness about environmental condition, emotional connectivity with the environment and Locus of control.<br>*External Factors:* Social factors, Economic factors, cultural and institutional factors. |
| Steg and Vlek (2009) | *Motivational Factors:* Cost and benefit analysis done, affection, moral values and norms. |
| Mc Donald (2014) | Various inter and intra personal factors, motivational, psychological and environment specific educational level. |
| Kurisee (2015) | Cognitive and affective dissonance, norms, attitudinal factors, various socio-demographic factors such as respondents age, their gender, level of education and income, situational factors, personality. |

There are many models available that are used to explain the reasons for pro-environment behaviour like:

- Norm Activation Model (Schwartz, 1977).
- Theory of Reasoned Action (Fishbein & Ajzen, 1975).
- Theory of Planned Action Behavior (Ajzen, 1991).
- Value-Belief-Norm Theory (Stern, 2000).

In, NAM Schwartz studied the generation of altruistic behavioural pattern, which consist of a combination of self-interested actions towards people, species and environment. Even NAM is considered capable of exploring various antecedent factors of humans to behave environmentally friendly manner (Bamberg & Möser, 2007). Theory of Reasoned Action, explained behavioural intentions influenced by willingness and an individual's beliefs about the point of view of the society for the action taken (Fishbein & Ajzen, 1975). In the theory of Planned Behaviour another behavioural factor was added, PBC (Perceived-Behavioural-Control). It refers to the belief one is holding in his/her own capabilities to behave in a certain environmentally-friendly way. Among the entire discussed model, the VBN (Value-Belief-Norms) model is widely accepted by the researchers. It consists of variables named as personal values, ecological worldview, awareness of consequences of the action taken, individual's ability to accept the responsibility to reduce threat to environment and a person's moral obligation to take actions that result in the favour of environment. This theory is a blend of value theory, Norm-Activation Model and NEP (new ecological paradigm).

## Concern for Environment and Cultural Biases Impact on PEB

Environmental concern means worries about environmental problems. Around two decades ago, it was found to be the most important factor to study environment-specific (Harland et al., 1999; Fujii, 2006; Lee et al., 2014). It was also assumed that the people, who would be having or showing a high rate of concern for the environment, must be acting more environmentally friendly (Tam & Chan, 2017). But a study conducted by Kollmuss and Agyeman is also talked about that it's not necessary people who behave in an environmentally friendly manner will show high concern for the environment.

## Research Methodology

To examine the impact of ecological concern on pro-environment behaviour, students from various institutions of Meerut was taken into consideration. These students are from technical courses like B.Tech, management students from BBA and MBA departments and also from

the educational department like B.Ed. and M.Ed. For analysing the data SPSS 21.0 was used.

For the construction of the questionnaire, the revised version of NEP (new ecological paradigm) scale was used. This NEP scale is used to measure worldview with different dimensions. To measure through this scale, responses were taken from strongly agree (1) to strongly disagree (5). Another instrument used to measure cultural biases was given by Price et al. (2014). They found four dimensions to measure cultural differences, which are A) Egalitarianism- which represents those individuals who have firm belief in the fragile nature of nature itself to behaviour in an environmentally friendly manner. B) Individualism- is those who considered nature a resilient activity about which they don't worry at all and so their actions. C) Hierarchism- consists of individuals who loved to have and follow policies or rules/regulations for their behaviour towards nature. D) Fatalist- believes that nature is something that cannot be predicted at all, so they don't think their power is sufficient to solve environment-specific problems.

Apart from ecological concern and cultural biases, 10 pro-environment behaviour practices questions were also asked of the students where responses ranged from 1-never to 5-always. A total of 42 items questionnaire was used to record responses. Both undergraduate and post graduate students were purposely selected for the current study as in the country like India, we have a population of young people, and they are expected to be highly aware of the present condition of the environment as well as this population is going to be the future doer for protecting the environment (Conte, 2016).

**Table 1: Demographic Factors of the Sample under Study**

| *Demographic Factors* | *Categories* | *Rate of Responses* | *Responses (%)* |
|---|---|---|---|
| Gender | Female | 35 | 31.8 |
| | Male | 73 | 66.4 |
| | Desire not to say | 2 | 1.8 |
| Education | Undergraduate | 62 | 56.4 |
| | Graduate | 48 | 43.6 |
| Course | Technical Dept | 74 | 67.3 |
| | Management Dept | 21 | 19.1 |
| | Educational Dept | 15 | 13.6 |

It is evident from the table that there are 67% of students who are male and around 32% are female students who took part in this study. Out of all the respondents, 57% are from UG and 44% are from PG. 68% of students are from technical courses (B.Tech), 19% are from management (BBA/MBA) and rest 13% are from educational department (B.Ed/M.Ed).

## Analysis

Analysis for this study was done by using SPSS software 21.0 and a paired sample *t*-test analysis was done to recognise the impact of cultural biases on concern and environmentally friendly behaviour.

**Table 2: Paired Sample t-Test**

| *Measures* | *Mean* | *SD* | *T* | *df* | *Sig.* |
|---|---|---|---|---|---|
| Hierarchical-Egalitarian | -.307 | .679 | -4.746 | 109 | .000 |
| Hierarchical-Individualistic | .907 | 1.097 | 8.674 | 109 | .000 |
| Hierarchical-Fatalist | 1.067 | 1.096 | 10.213 | 109 | .000 |
| Egalitarian-Individualistic | 1.214 | 1.014 | 12.558 | 109 | .000 |
| Egalitarian-Fatalist | 1.374 | 1.054 | 13.672 | 109 | .000 |
| Individualist-Fatalist | .160 | 1.02 | 1.637 | 109 | .104 |

From the above table it is evident that the first environmental cultural tendency of the respondents is towards egalitarian as values ranging from 4.75 to 13.7 at a significant p-value (p>.000). After its hierarchical tendency was found to have values from 8.67 to 10.21 (p>.000). Furthermore, it was also found that there exists no considerable difference between individualists and fatalist cultural biases.

Another test was one-way ANOVA again with the help of SPSS 21.0 software. The purpose of using this test was to find the difference among technical, management and educational students.

**Table 3: One-Way ANOVA**

| *Measures* | *N* | *Mean* | *SD* | *F* | *Sig.* |
|---|---|---|---|---|---|
| Ecocentric | 110 | 3.909 | .571 | 14.266 | .000 |
| Anthropocentric | 110 | 2.836 | .576 | 4.189 | .018 |
| Hierarchical | 110 | 3.960 | .729 | 4.912 | .009 |
| Egalitarian | 110 | 4.267 | .638 | 6.978 | .001 |
| Individualist | 110 | 3.053 | .746 | 3.084 | .050 |
| Fatalist | 110 | 2.893 | .780 | .502 | .607 |
| Pro-environment Behavior | 110 | 3.608 | .580 | 5.679 | .005 |

Because there was a variation in the respondents of different courses, so Hochberg's GT2 Post-hoc Test was used. From the above it is clear that there is a significant difference in the ecological worldview of the students studying different streams. ANOVA test shows that the technical courses have more hierarchical as well as egalitarian cultural biases in comparison to other courses students considered for this study. As, more the egalitarian tendency among the students signifies their high concern for environment. So, we can say among all technical students, they are expected to behave more environmentally friendly in their actions.

## Conclusion

The goal of the current study was to determine how cultural prejudices and environmental concerns affected the pro-environment behaviour of Meerut students enrolled in various courses. The results provide insight on the intricate interaction between these variables and how they affect behaviour that is environmentally beneficial.

The investigation showed that cultural prejudices and environmental concern had a considerable impact on pro-environment behaviour. Environmental concern—a measure of people's anxieties about environmental issues—has been linked favourably to pro-environment behaviour. High levels of environmental awareness were noted, although this did not necessarily convert into environmentally responsible behaviour.

Different cultural biases, such as equality, individualism, hierarchism and fatalism, were found to influence pro-environment behaviour to varied degrees. Higher levels of pro-environment behaviour were demonstrated by students with egalitarian tendencies, who recognised the vulnerability of the environment and felt morally obligated to preserve it. It has been suggested that following rules and regulations can encourage environmentally friendly behaviour because hierarchical tendencies are favourably connected with pro-environment behaviour. Individualistic and fatalistic attitudes, however, did not significantly affect behaviour that was pro-environment.

The study also looked at the disparities in cultural prejudices and pro-environment behaviour among students in various courses. In comparison to management and educational students, technical course students were shown to have higher levels of both hierarchical and egalitarian cultural biases, indicating a greater concern for the environment and a higher likelihood of engaging in pro-environment behaviour.

These findings demonstrate the significance of taking into account cultural biases in addition to environmental concerns when analysing pro-environment behaviour. They contend that encouraging environmental knowledge and developing a sense of environmental responsibility can have a favourable impact on pro-environment behaviour. Additionally, knowing people's cultural prejudices and adjusting environmental interventions

accordingly can help develop more successful tactics for encouraging sustainable behaviour.

These findings emphasise the need to address both individual concerns and cultural factors in order to encourage pro-environment behaviour among students and, ultimately, help achieve the SDG related to responsible production and consumption. These findings have implications for policymakers, educators and environmental practitioners.

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# Ardent Customers Brand Preference for Smart Phones: A Study of Jammu Region

**Vipul Chalotra*, Gorakshak Verma****

**Abstract**

With the advent of smart phones and smart phone in the industry a high revolution had been seen in the buying behaviour of the customers that generally had placed the customers on the heights. The smart phone is a requirement of each and every individual as an abundance of daily and imperative work is done on phones via the internet. The customer contemporarily had become choosy, and they prefer one phone over another. The article is a simple and straight research from the field of Jammu where people brand preference for smart phone is seen. The paper portrays the brand preference through a self-designed a questionnaire and primary data were collected from Jammu region. The results reveal that people prefer that brand that is not so highly priced and the brand which is offering a bundle of attributes with low prices. Majority of the customers from the sample were satisfied with the brand of mobile phone they were using, and fewer were questing for other highly priced brands. The research is limited to the Jammu region and the results so drawn could not be considered as a whole.

**Keywords:** Smart Phones, Mobile, Customers, Behaviour, Brand

## Introduction

Communication contemporarily adopts a key role in the contemporary world as mobile phones are most dynamic and crucial innovation for humans. The basic purpose of human communication defeats its purpose without the mobile phones, as it has actually changed the way of communications and had become the need of the hour for everyone. In modern times, it's difficult to locate a person who does not own or have a mobile phone as this boon in terms of gadget had become the essential element of life for every human. Mobiles presently occupy a very interesting and popular position in consumer electronics products and immense marketing of this product takes place in the market. Customers are hovering for this product day and night, rather in and out. Furthermore, with the internet connection and to foster human connectivity, the demand for mobile phones has been raised. Taking prop up of this gadget, at the time of urgency, GPS (Global Positioning System) capability has done the job of life saver in order to track cell phone users. People cannot live without their cell phones as it had become their need. Customers' needs and preferences had led the technological advancements and frequent innovations with dynamic markets portfolio in the history and development of the mobile phone industry (Sharma, 2017). According to Hasan (2023), the market had witnessed a rapid growth of the mobile phone industry, which it is, experiencing due to many innovations in phone features that are affordable by the customers.

*"The future for mobile is future for everything" as said by Jennifer Ritchie Payette.*

## Mobile Phone

The Oxford English Dictionary says that one of the initial propounds of the word "mobile" was related to the Latin phrase "mobile vulgus", i.e. emotional crowd. But, nowadays mobile phones are living onto these origins. The advent of new senses of speed, emotions, connectivity and ease of work had been impacted by modern mobile

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phone technology that had really enhanced social life and scenario. The old, traditional and fixed pattern of telephone had developed communication links or had filled communication gaps, but this new "mobile" puts them straight into the hands of individuals while making them feel comfortable and enjoy taking it easily anywhere, anytime (Jose, 2019).

## Evolution of Mobile Phone in India


**Fig. 1: Evolution of Mobile Phones**

In 1990's Nokia was the first mobile phone company to launch a mobile phone in India. During 1995, the Modi group was the first service provider in Kolkata (Nilmini, 2017; Rath, 2019). With the advancement, India now witnesses the second-largest mobile phone user Country user, which accounts for 1,034,253,328 mobile phones. This reveals the audacity of mobile phone acceptance and usage in India. There are many national and international brands available to users, like Samsung, Apple, Micromax, Oppo, Lenovo, Oneplus, Motorola and Videocon. Intex, Nokia, Lava, Realme, Xiaomi, etc. It's seen and observed that the youth is frequently and highly attracted to purchasing and using mobile phones. There exists positive and close relationship between youth and the mobile market (Kumari & Kumar, 2023). Whenever a new electronic gadget or multimedia is launched, the crowd of the prospective buyers can be seen widely and who can foster the demand of the same and can give a glimpse of the new brand arrival. This reveals the interest and popularity advantage of mobile phones among youngsters (Leela, 2019).

The different generations- 1G, 2G, 3G and 4G cellular phone services are gaining momentum, with a diverse generation. The different generations that had used this cellular communication throughout is as under:

- *Zero Generation (0G)* – This generation used pre-cell phone mobile telephony technology such as ARP, MTS, PTT, AMTS and IMTS.
- *First Generation (1G)* – This generation witnessed the wireless telephone technology and prominently used NMT, TACS, AMPS and RTMI cell phones.
- *Second Generation (2G)* – Sending email, digital voice calls based on data were used by this generation through digitalised wireless telephone technology via: PCS, TDMA, CDMA.
- *Generation 2.5* – This generation took advantage of the circuit-switched domain.
- *Third Generation (3G*) – This generation impressed upon the mobile telephone technology through CDMA 2000.
- *Fourth Generation (4G)* – This generation witnessess high-speed mobile wireless access. It also demonstrates and describes pervasive networks.
- *Fifth Generation (5G)* – Characterised by fast-speed internet.

## Review of Literature

| Sr. No. | Author(s) (Year) | Objective | Nature of Paper /Sector/ Research | Sample size/ Respondents/ Analysis | Findings | Limitation/ Future Research |
|---|---|---|---|---|---|---|
| 1. | Sarath and Suchit (2022) | To examine the influence of demographic factors on customers buying behaviour of mobile phones and to examine factors influencing the purchase behaviour of customers towards mobile phones users with reference to college students. | The paper is empirical in nature & sector covered is marketing. | The sample size was 300 and data was collected from Chennai city. The data were collected via Google Forms. The data were analysed using the SPSS software. | The study showed that features of the smart phone like social media, camera, music and other application, games, etc are highly influencing the respondents. | Only 300 samples are taken in this research paper. But more samples can be taken. More statistical methods can also be used. |
| 2. | Rout et al. (2021) | To examine the customers perception with regard to size, features, battery capacity, screen type and to investigate whether consumer perceives the different types of brands equally. | The paper is empirical in nature & sector covered is marketing. | The study took place in Bhubaneswar. 127 Respondents were contacted for obtaining response through a structured questionnaire. Data was analysed with the help of ANOVA , Bonferroni post hoc test, graphs and charts. | The results revealed that 84 customers preferred medium size phones followed by high storage capacity of RAM and ROM and subsequently high resolution camera. | It's difficult to predict the behaviour of consumer. The sample size is limited to 127 samples, more samples can be covered |
| 3. | Shakeel et al. (2023) | To understand the mobile phones brand preference among management students and to identify the factors which influence in selecting a particular brand. | The study is descriptive in nature. | The sample size was 972. Sampling Technique: simple random sampling was used for the collecting sample. Statistical Tools: percentages, graphs and chi-square were used. | 62% of the respondents use Oppo. 74% of the respondents buy it because of its slim and light weight design. Most of the respondents get information from Television advertisements. The first factor which influences students is the price range. | The study is limited only to Medchal Region. The time was very limited. More statistical tools can be used. |
| 4. | Kaushik (2022) | To investigate the reasons as to why customers prefers particular brand of mobile phone and to identify factors affecting consumer preference. | The research Is descriptive in nature and sector covered is marketing. | 100 respondents were chosen for obtaining response through convenience sampling. Chi-square, Regression, and ANOVA were used to analyse the data. | The results revealed that management students choose Nokia brand because it imparts value for money. It was also portrayed that television, newspapers and the internet are the main sources of mobile brand learning.. | The study was only confined to 100 respondents.The time limit is one of the main factors to conduct the study effectively. The respondent may not be true in filling up the questionnaire. |

| Sr. No. | Author(s) (Year) | Objective | Nature of Paper /Sector/ Research | Sample size/ Respondents/ Analysis | Findings | Limitation/ Future Research |
|---|---|---|---|---|---|---|
| 5. | Akpan et al. (2022) | To investigate the influence of mobile phone attributes anf features among the students of university in Akwa Ibom State. | The present paper is empirical in nature. | A total of 150 samples respondents were selected from the study area. It is done through questionnaire. Specifically, frequency count and simple percentages were used to analyse the personal data of the respondents, simple regression was used to test the hypotheses. | The study revealed that brand popularity has a significant influence among the students of university in Akwa Ibom State. Moreover, price influences mostly the students. | A larger sample size with wider variables such as celebrity endorsement, demographic attributes, ease-of-use, etc could be taken into consideration. |
| 6. | Pawar et al. (2021) | To explore why customers prefer particular branded mobile phone. | This paper is descriptive in nature. | The sample size taken for the study is 100. Simple random sampling technique is applied. Pie chart, Google Forms, ANOVA were used for data analysis. | Mi is the most preferred brand for a college student. 40% of students change their cell phones within 1 to 2 years, 45% of students pays less than 10 000 on mobile phones purchases. | A smaller sample size is taken for study, Time and money was another limitation in this research. |

## Research Design and Methodology

The chapter depicts significance and objectives of the study.

### Significance of the Study

The study collected and analysed information about mobile phone usage and trends. The researchers took into consideration the mobile phone brand preferred by individuals in Jammu City.

### Objectives of the Study

Following are the main objectives of the study:

- To examine the satisfaction level towards various brands of mobile phones.
- To identify individual's preferences connected with various brands of mobile phones.
- To investigate the main features individuals take into consideration in a mobile phone.
- To gather the information regarding the advertisement media that mostly affect the individuals purchase decision.

### Sample Design

The study attempts to identify to what extent the customer's preferred different mobile brands. Therefore, the sample of the study consists of customers who are using mobile phones in Jammu city.

### Sampling Method

Convenience sampling method is used for this study.

### Sampling Size

The sample size for the research was fixed at 30. 30 respondents were chosen for the study, and all of them were contacted and all responded, portraying the response rate of 100%.

### Methods of Data Collection

Primary data or first-hand data were collected mainly through an online survey. An electronic questionnaire was designed through Google Form and made available via the internet (i.e. a hyperlink was created and sent to the respondents).

Secondary sources of data for the study were research papers published in eminent journals, books in libraries, newspapers, etc.

### Data Analysis and Techniques

The tools used for data analysis include percentages and pie charts.

### Limitations

- The sample size of the present study was small (30).
- Only the questionnaire method is used here.
- Limited brands are chosen for the report.
- The study is confined to Jammu region only.
- The time spent was limited due to which an exhaustive study could not be conducted.
- The study has applied convenience sampling method for data collection. Hence the result of study cannot be exactly generalised for future reference.

## Data Analysis and Interpretation

### Demographic Profile

#### Gender

The study found that 60% of the respondents are females and 40% are males.

**Table 1: Frequency Distribution of Gender**

| *Gender* | *Percentage* | *Frequency* |
|---|---|---|
| Male | 60 | 18 |
| Female | 40 | 12 |
| Total | 100 | 30 |

## Age

Majority of the respondents are of the age group of 20-30 (83.3%) followed by the age group of below 20 (10%) and then finally 30-40 (6.7%).

**Table 2: Frequency Distribution of Age**

| *Age* | *Percentage* | *Frequency* |
|---|---|---|
| Below 20 | 10 | 3 |
| 20-30 | 83.3 | 25 |
| 30-40 | 6.7 | 2 |
| 40-50 | - | - |
| 50 and Above | - | - |
| Total | 100 | 30 |

## Monthly Income

Most of the respondents have a monthly income of less than 25,000 (83.3%), followed by 25,001 – 50,000 (10%) and more than 100,000 (6.7%).

**Table 3: Frequency Distribution of Monthly Income**

| *Monthly Income* | *Percentage* | *Frequency* |
|---|---|---|
| Less Than 25000 | 83.3 | 25 |
| 25001-50000 | 10 | 3 |
| 50001-75000 | - | - |
| 75000-100000 | - | - |
| More Than 100000 | 6.7 | 2 |
| Total | 100 | 30 |

## Occupation

Based on the responses received, it can be concluded that the majority of respondents were sudents (83.3%) followed by business (10%) and then finally doing service and professional by (3.3%) each.

**Table 4: Frequency Distribution of Occupation**

| *Occupation* | *Percentage* | *Frequency* |
|---|---|---|
| Student | 83.3 | 25 |
| Service | 3.3 | 1 |
| Professional | 3.3 | 1 |
| Business | 10 | 3 |
| Agriculture | - | - |
| Housewife | - | - |
| Total | 100 | 30 |

# Product Related Information

## Brand of Phones Used by the Individuals

From the above we can conclude that out of the 30 respondents, 20% are using Samsung phones, Realme and Oppo each, 13.3% are using Apple, Xiaomi each, 6.7%, are using Vivo and 6.7% are using other brands.

**Table 5: Table Showing Brand of Phones Used by Individuals**

| *Opinion* | *Percentage* | *Frequency* |
|---|---|---|
| Samsung | 20 | 6 |
| Vivo | 6.7 | 2 |
| Apple | 13.3 | 4 |
| Realme | 20 | 6 |
| Lenovo | - | - |
| Xiaomi | 13.3 | 4 |
| Nokia | - | - |
| Oppo | 20 | 6 |
| Others | 6.7 | 2 |
| Total | 100 | 30 |

## Model of Phones Used by Individuals

The study shows that individuals used different models of phones even for the same brand. Some of Models of mobile phones that individuals used are the Samsung A32 5G, Realme 7s, RMX 1825, Realme 7, Realme 8 5g, Oppo 356, Iphone 15 and others.

## Reasons for using Above Mentioned Model

From the above it can be said that out of the 30 respondents, 40% of respondents used above-mentioned models because of camera quality, 26.7% of respondents used above mentioned models because of brand image, 13.3% of respondents used above models because of processor and for other reason and 3.3% of respondents used the above models because of screen size and RAM.

**Table 6: Table Showing Reasons for using Above Mentioned Model**

| *Opinion* | *Percentage* | *Frequency* |
|---|---|---|
| Camera | 40 | 12 |
| Processor | 13.3 | 4 |
| Brand Image | 26.7 | 8 |
| Display Quality | - | - |
| Screen Size | 3.3 | 1 |
| Ram | 3.3 | 1 |
| Others | 13.3 | 4 |
| Total | 100 | 30 |

## Most Used Features in Mobile Phone

Out of the 30 respondents, 40% of respondents are using their phone for social networking purpose, 120% is used for calls purpose and the rest for other purposes.

**Table 7: Table Showing Reasons Most Used Feature in Individual's Mobile Phone**

| *Opinion* | *Percentage* | *Frequency* |
|---|---|---|
| Text Messaging | 6.7 | 2 |
| Social Networking | 40 | 12 |
| Entertainment | 16.7 | 5 |
| Internet Browser | 10 | 3 |
| Games Application | 6.7 | 2 |
| E-Mail | - | - |
| Calls | 20 | 6 |
| Video Call | - | - |
| Total | 100 | 30 |

## Latest Mobile Facilities which Individuals are Aware of

Majority of the students are aware of the latest mobile facilities. 5G - 50%, 23.3% - fast charging and 16.7% - gorilla glass protection, 6.7% - NFC and 3.3% - processor.

**Table 8: Table Showing Latest Mobile Facilities Which Individuals are Aware**

| *Opinion* | *Percentage* | *Frequency* |
|---|---|---|
| 5G | 50 | 15 |
| Nfc | 6.7 | 2 |
| Processor | 3.3 | 1 |
| Fast Charging | 23.3 | 7 |
| Gorilla Glass Protection | 16.7 | 5 |
| Total | 100 | 30 |

## Type of Mobile Phone Individual Prefers

Out of the 30 respondents, most of the individuals, i.e., 46.7%, preferred Android because of the quality and various features available in it. 43.3% preferred iPhone because of its features, popularity and latest trend.

**Table 9: Table Showing Type of Mobile Phone Individual Prefers**

| *Opinion* | *Percentage* | *Frequency* |
|---|---|---|
| Plain Old Cell Phone | 3.3 | 1 |
| Symbian | - | - |
| I-Phone | 43.3 | 13 |
| Black Berry | 6.7 | 2 |
| Android | 46.7 | 14 |
| Windows Mobile | - | - |
| Total | 100 | 30 |

## First Preference of Individuals on Mobile Brands

From the above, most of the individuals i.e., 36.7%, prefer Apple as their 1st choice.

**Table 10: Table Showing First Preference of Individuals on Mobile Brands**

| *Opinion* | *Percentage* | *Frequency* |
|---|---|---|
| Samsung | 30 | 9 |
| Vivo | 3.3 | 1 |
| Apple | 36.7 | 11 |
| Realme | 3.3 | 1 |
| Lenovo | - | - |
| Xiaomi | 3.3 | 1 |
| Nokia | 6.7 | 2 |
| Oppo | 10 | 3 |
| Others | 6.7 | 2 |
| Total | 100 | 30 |

### Overall Satisfaction of Individuals Towards Different Mobile Brands

**Table 11: Table Showing Overall Satisfaction of Individuals Towards Different Mobile Brands**

| *Opinion* | *Percentage* | *Frequency* |
|---|---|---|
| Highly Satisfied | 16.7 | 5 |
| Satisfied | 40 | 12 |
| Somewhat Satisfied | 20 | 6 |
| Neutral | 16.7 | 5 |
| Somewhat Unsatisfied | 6.7 | 2 |
| Unsatisfied | - | - |
| Highly Unsatisfied | - | - |
| Total | 100 | 30 |

## Major Findings

- Most of the respondent's income reported per month is less than 25000.
- In Jammu City, most of the customers are using Samsung, Realme and Oppo mobile phones (20%).
- Quality was the first and the foremost factor that determines consumer purchase is mostly consumers reasoned quality (53.3%) for using mobile phones. Second, they look for brand image of the mobile phone (20%).
- 40% use the phone for social networking purposes.
- Individuals are aware of 5G, fast charging, gorilla glass protection, but very few are aware of processors and NFC.
- Apple has the most attractive advertisement, i.e., 56.7%, followed by Samsung, 23.3%.
- Most preferred brand among the individuals in Jammu City is Apple (36.7%) and least preferred is Lenovo.
- Most of the individuals, i.e., 36.7% are willing to pay 20001–40000 for a mobile phone.
- Individuals, i.e., 46.7%, prefer to buy android rather than iPhone.
- 40% of respondents are satisfied with their mobile phones, and 20% are somewhat satisfied.

## Suggestions

- Since Lenovo and Nokia are less preferred brands. They need to focus on selling strategies in order to increase the customer base.
- Mobile companies should pay attention to solving the heating issues as it's the burning problem found in each mobile phone brand.
- Mobile companies must provide free services and facilities in Jammu.
- Improve security measures for android phones.
- Reasonable purchase price enhances sales, and therefore the mobile phones must be sold at reasonable price.
- Improve the camera resolutions and pixels.
- Update the style and looks of the phone.
- Increase in the phone memory will enable the brands to be selected more.
- Festival offer like exchange offers, discounts should be given due consideration in order to keep and maintain the company image.
- Customer care centres and services should be given due care and well-qualified & trained staff should be deployed at the service centres to enhance brand reputation.

## Conclusion

As the time has moved on, the users of mobile phones have increased tremendously. The uses of mobile phones for making phone calls have changed with the introduction of smart phones and wireless technology. The individuals in Jammu City choose mobile brands on the basis of their price and quality of mobile phone. Most of the individuals in Jammu City have mobile phone and most of them own a brand that costs more than RS 10,000 because of customers meagre income. Since mobile phones are effective and convenient medium for communication, they have a positive influence on the daily routines. It was concluded that most of the people were satisfied with the mobile phones that they were using and some were still questing for more.

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