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APPLIED RESEARCH IN SOCIAL SCIENCES, COMMERCE AND MANAGEMENT

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PREFACE

The book *Applied Research in Social Sciences, Commerce and Management* is a timely contribution that highlights the growing significance of interdisciplinary research in addressing contemporary social, economic, and organizational challenges. In an age marked by globalization, technological transformation, digital innovation, changing consumer behavior, and evolving public policies, applied research has become an essential means of generating practical knowledge and evidence-based solutions for sustainable development.

This edited volume brings together valuable contributions from academicians, researchers, scholars, and professionals who have explored diverse themes across the broad disciplines of social sciences, commerce, and management. The chapters present empirical studies, conceptual analyses, innovative methodologies, and practical case studies that deepen our understanding of current issues while providing meaningful recommendations for policymakers, educators, business leaders, entrepreneurs, and practitioners. Together, these contributions demonstrate how academic research can effectively bridge the gap between theory and practice.

The book covers a wide spectrum of subjects, including economics, business management, finance, accounting, marketing, entrepreneurship, human resource management, organizational behavior, sociology, education, public administration, governance, and sustainable development. By integrating multidisciplinary perspectives, it encourages readers to appreciate the interconnected nature of these fields and the importance of collaborative approaches in solving complex societal and business problems.

We express our sincere gratitude to all contributing authors for their dedication, scholarly excellence, and commitment to advancing knowledge through quality research. Their valuable contributions have made this publication both comprehensive and relevant. We also extend our heartfelt appreciation to the reviewers and editorial team for their constructive suggestions, careful evaluations, and unwavering support in maintaining the academic quality of this volume.

We hope this book serves as a valuable resource, inspiring research, innovation, interdisciplinary collaboration, informed decision-making, academic excellence, professional growth, and meaningful contributions toward sustainable societal and organizational development.

- Editors

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BRIDGING THE MACRO-MICRO GAP: THE NEED FOR HYPER-LOCAL AND VILLAGE-LEVEL AGROMET EXTENSION

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Abstract

Traditional agricultural extension systems heavily rely on macro-meteorological data generated at the regional or district level. While these forecasts offer broad atmospheric indicators, they frequently fail to capture micro-climatic variations, leading to field-level discrepancies. Empirical feedback from a localized study in the NTR District of Andhra Pradesh revealed that while general forecast satisfaction remains high under the District Agromet Unit (DAMU) scheme, a distinct 24% to 27% margin of perceived inaccuracy exists due to the limitations of broad geographic forecasting boundaries. This chapter examines the critical limitations of macro-meteorological grids, evaluates the technical integration of village-level Automated Weather Stations (AWS), and introduces participatory extension frameworks designed to capture real-time, field-level feedback. By decentralizing agromet data collection, agricultural extension can transition from reactive advisories to predictive, hyper-local precision farming, significantly mitigating production risks for smallholder farmers.

Keywords: Automated Weather Stations, Digital Extension, Hyper-local Forecasting, Micro-climate, Participatory Extension.

1. Introduction

Modern agriculture operates under a regime of heightened climate uncertainty. Extreme weather events, erratic precipitation distribution, and shifting thermal boundaries require highly adaptive farm management strategies (Chandel *et al.*, 2024). Under the Gramin Krishi Mausam Sewa (GKMS) scheme implemented by the India Meteorological Department (IMD) and the Indian Council of Agricultural Research (ICAR), District Agromet Units (DAMUs) have significantly improved localized agro-advisories. Despite these institutional advancements, a persistent structural challenge remains: the macro-micro gap. Standard meteorological models operate on grid resolutions that generalize data across hundreds of square kilometers. However, topography, vegetation cover, soil moisture profiles, and local water bodies create highly localized micro-climates. A district-level forecast might predict light showers, yet a specific village 30 kilometers

away might experience heavy downpours or dry conditions. Bridging this spatial gap requires shifting agricultural extension from district-level overviews to hyper-local, village-level data systems. This transformation is essential for optimizing critical farm decisions such as irrigation scheduling, pesticide applications, and harvesting timelines.

2. Contextualizing the Problem: Empirical Evidence from the Field

To understand how spatial resolution impacts the utility of weather advisories, field feedback was gathered from 90 active beneficiary farmers within the operational jurisdiction of the DAMU at KVK Garikapadu, NTR District, Andhra Pradesh. While the delivery infrastructure proved highly efficient (96% bulletin receipt rate and 100% bi-weekly consistency), structural limitations emerged regarding forecast precision.

Table 1: Farmers' Perceived Inaccuracy in District-Level Forecasts (N=90)

Meteorological Parameter Category	Perceived Accurate (F/%)	Perceived Inaccurate (F/%)	Main Field Discrepancy Observed
Routine Parameters (Rainfall, Temperature, Humidity, Wind Speed)	66 (73.00%)	24 (27.00%)	Spatial variation in actual rainfall onset; generalized wind speed estimates during spraying windows.
Extreme Events (Cyclones, Heatwaves, Cold Waves)	68 (76.00%)	22 (24.00%)	Variations in localized wind speeds and localized temperature spikes during heatwaves.

The fact that 24% to 27% of farmers observed distinct variations between the received forecasts and actual field realities highlights the limits of macro-level grid modeling. When a farmer encounters a dry spell during a period predicted to have high rainfall, or experiences sudden unpredicted showers during post-harvest drying, institutional trust declines. This disconnect confirms that district-level boundaries are too broad for precise crop management.

3. Limitations of Macro-Meteorological Grids

Macro-meteorological forecasting relies on computational grids that typically range from 12 km×12 km to 50 km×50 km. While highly effective for tracking large atmospheric systems like low-pressure zones or monsoonal troughs, these grids introduce several challenges when applied directly to localized farming:

- **Averaging Effect over Topographies:** The model averages elevation, surface roughness, and vegetation across the entire grid square. If a grid includes both hilly

terrains and plains, micro-climatic variances like cold air drainage or slope-induced precipitation variations are completely lost.

- **Convective Rainfall Mismatch:** Summer monsoonal showers are often driven by localized convective clouds that develop over a few kilometers. Macro-grids cannot pinpoint the exact paths of these storms, resulting in a scenario where one village receives heavy rain while an adjacent village remains completely dry.
- **Sub-Optimal Chemical Application Windows:** Modern plant protection requires specific atmospheric windows. For example, applying a systemic fungicide requires a minimum of 2 to 3 rain-free hours and wind velocities under 10 km/h. Generalized district forecasts cannot provide this micro-window precision, leading to chemical wash-off or spray drift losses.

4. The Role of Automated Weather Stations (AWS) at the Village Level

The primary technical intervention required to eliminate the macro-micro gap is the strategic deployment of village-level Automated Weather Stations (AWS). An AWS is a self-powered, compact meteorological unit configured with specialized sensor arrays that log ambient parameters at high frequencies (e.g., every 15 minutes) and transmit data directly to cloud servers via cellular networks.

Sensor Configurations and Agro-Extension Value

To provide real-time value to local extension services, a village-level AWS should track several key parameters:

- **Sonic Anemometers:** Provide real-time data on wind speed and direction to determine precise pesticide spraying windows.
- **Tipping Bucket Rain Gauges:** Measure exact localized precipitation volumes to calculate precise soil moisture balances.
- **Piezoelectric Leaf Wetness Sensors:** Monitor the duration of moisture on plant canopies, providing early warnings for fungal pathogens like late blight or downy mildew.
- **Multi-Depth Soil Probes:** Measure soil temperature and volumetric water content (VWC) at depths of 10 cm, 30 cm, and 60 cm to automate localized irrigation recommendations.

Technical Comparison of Forecast Ecosystems

Operational Parameter	Traditional District-Level Grid Model	Proposed Hyper-Local Village AWS Model
Spatial Resolution	Broad regional grids (12 km to 50 km)	Hyper-local point data (1 km to 3 km radius)
Data Refresh Rate	12 to 24-hour intervals	Real-time intervals (15 to 30 minutes)
Micro-Climature Sensitivity	Low (ignores local topography and vegetation)	High (captures village-specific soil and canopy moisture)
Primary Extension Application	General seasonal planning and macro crop choices	Daily operational tasks (spraying, irrigation, harvesting)

5. Participatory Extension Approaches for Field-Level Feedback

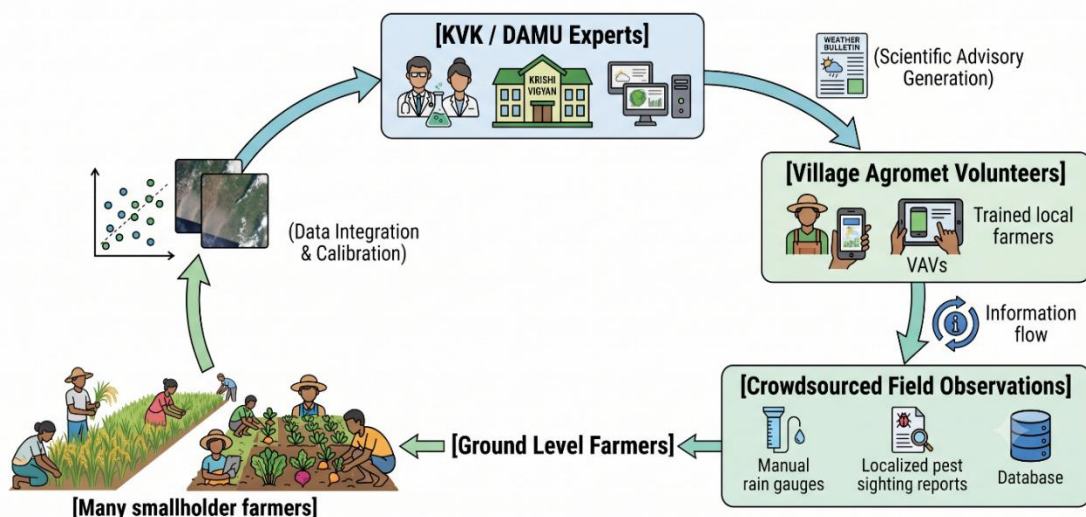
Technology alone cannot bridge the macro-micro gap; it must be coupled with human-centric extension frameworks. Participatory Agromet Extension (PAE) engages farmers not merely as passive recipients of weather data, but as active co-producers of climate knowledge.

The Feedback Cycle Framework

To optimize the flow of information between fields and forecasting centers, extension units can implement a three-tiered participatory network:



The Feedback Cycle Framework: Integrated Agromet Extension for Climate-Resilient Agriculture



- **Village Agromet Volunteers (VAVs):** Appointing trained progressive farmers or rural youth as VAVs within each village cluster. These volunteers act as local coordinators who maintain the AWS units and assist less tech-savvy farmers with digital tools.
- **Crowdsourced Citizen Science Observations:** Equipping farmers with manual, low-cost plastic rain gauges. Farmers log actual rainfall amounts via simple mobile forms or WhatsApp interfaces. This crowdsourced data provides validation points that meteorologists can use to calibrate satellite and radar models.
- **Real-Time Crop Phenology Reporting:** Farmers use mobile applications like *Meghdoot* to report localized pest infestations or crop damage alongside current local weather notes. This integration links weather conditions directly to crop health outcomes, creating a highly responsive agro-advisory ecosystem.

Conclusion and Recommendations

The 24% to 27% forecast discrepancy identified by smallholder farmers in the NTR District underscores a critical need to transition from broad district-level advisories to hyper-local weather systems. Bridging the macro-micro gap requires a coordinated approach combining advanced meteorological technology with participatory extension strategies.

To achieve this transformation, agricultural extension networks should prioritize the following actions:

- **Deploy Village-Level AWS Networks:** Establish public-private partnerships to install low-cost, automated weather networks across dense agricultural clusters.
- **Integrate Hyper-Local Data into Mobile Platforms:** Update applications like *Meghdoot* to deliver automated, village-specific alerts based on real-time sensor thresholds.
- **Train Local Agromet Volunteers:** Build community capacity by training village volunteers to manage weather instruments and lead participatory data collection.

Implementing these hyper-local improvements will protect smallholders from sudden weather risks, optimize input use efficiency, and build long-term climate resilience across vulnerable agricultural landscapes.

References

1. Chandel, N., Kumar, A., & Kumar, R. (2024). Towards Sustainable Agriculture: Integrating Agronomic Practices, Environmental Physiology and Plant Nutrition. *International Journal of Plant & Soil Science*, 36(6), 492–503.

2. Ghasura, R. S., Patel, U. M., & Mavadiya, S. V. (2025). Climate Change and Global Agriculture: Diagnosis, Impacts and Strategic Management. *Farming Under Stress: Climate Change and Agriculture*, 71.
3. Meena, H. R., Prasanna, R., & Singh, A. K. (2023). Efficacy of digital climate extension services: An empirical assessment of mobile-app based advisories. *Journal of Agricultural Extension Management*, 24(2), 45-58.
4. Rathore, L. S., Chattopadhyay, N., & Singh, K. K. (2022). Ground-level evaluation of Gramin Krishi Mausam Sewa (GKMS) in India: Success and scalable lessons. *Journal of Agrometeorology*, 24(1), 12-23.
5. Sahoo, D., & Moharaj, P. (2024). Assessing agricultural vulnerability to climate change through dynamic indexing approach. *Environmental Science and Pollution Research*, 31(42), 55000-55021.
6. Venkatesh, K., Murthy, G. R. K., & Rao, V. U. (2024). Digital transformations in Indian extension systems: Adoption pathways for smallholder agromet services. *Technology in Society*, 76, 102430.

POST-PANDEMIC JUDICIAL APPROACHES TO BANKING FRAUD AND CYBERSECURITY CHALLENGES IN INDIA

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Abstract

This article examines the evolving legal and regulatory landscape surrounding banking frauds in India during and after the COVID-19 pandemic. It analyses judicial rulings, case law, and policy directives from 2021 to 2026, focusing on how courts have reinforced consumer rights, accountability, and the importance of robust cybersecurity standards. The central research question investigates how judicial and legal approaches have adapted to address banking frauds amidst increased digital transformation and cyber threats, and what implications these trends hold for regulatory compliance, consumer protection, and institutional accountability. The study highlights key cases exemplifying judicial emphasis on real-time fraud detection, cybersecurity infrastructure, and prompt grievance redressal, while also emphasizing the role of regulators in strengthening standards. Ultimately, the article underscores the need for banks to adopt advanced technological solutions, foster transparency, and proactively align with legal mandates to ensure resilience and trustworthiness in the digital banking ecosystem.

Keywords: Banking Fraud, Cybercrime, COVID-19, Judicial Trends, Banking Regulation.

Introduction

The COVID-19 pandemic has profoundly impacted various sectors worldwide, especially the banking industry (Marcu, 2021). While digital transformation accelerated to ensure financial inclusion and continuity, it also exposed systemic vulnerabilities that cybercriminals exploited (Oladinni and Odumuwan, 2025). The surge in digital transactions, coupled with economic uncertainties, led to a rise in banking-related scams and frauds, prompting courts and regulatory bodies to adapt their legal frameworks and judicial approaches (Shpachuk *et al.*, 2026). This paper explores the evolving landscape of banking fraud during the pandemic, examining notable cases, judicial responses, and the implications for regulatory compliance and consumer protection.

Methodology

This study adopts a qualitative analytical approach, utilizing case law analysis, judicial rulings, and regulatory guidelines issued during and after the COVID-19 pandemic. It critically examines

high-profile banking fraud cases from 2021 to 2026, focusing on legal proceedings, court judgments, and policy directives. Data sources include judicial records, official bank and regulatory circulars, legal commentaries, and credible news reports. The objective is to identify emerging judicial trends, legal principles, and policy implications that shape the future of banking fraud prevention and resolution.

The Central Research Question that has been discussed here:

How have judicial and legal approaches evolved in India to address banking frauds during the COVID-19 pandemic, and what implications do these trends hold for banking regulation, consumer protection, and institutional accountability?

Discussion

The pandemic-induced shift to digital banking increased opportunities for cybercriminals. Cyber frauds, including unauthorized transactions, phishing, vishing, and social engineering, surged during this period. The rapid digitalization outpaced the implementation of robust security measures, leading to systemic vulnerabilities (Zamil and Faruq, 2022). High-profile cases exposed lapses in cybersecurity, negligence, and the need for stricter compliance.

Notable Judicial Cases and Their Significance

A. Bombay High Court Orders Bank of Baroda to Refund ₹76 Lakh (2024)

In one landmark case, the Bombay High Court ordered Bank of Baroda to refund ₹76.9 lakh following unauthorized online transactions (Shrivastava, 2024). The court emphasized the bank's failure to adhere to RBI guidelines, which stipulate customer liability limits when fraud is reported within three days (Shrivastava, 2024). The judgment reaffirmed that banks are responsible for safeguarding customer funds, especially when victims act promptly. The case reinforced principles of bank accountability, consumer protection, and the importance of real-time fraud monitoring.

B. Delhi High Court's Ruling in Hare Ram Singh v. SBI (2024)

The Delhi High Court held SBI liable for ₹2.6 lakh lost due to a vishing attack (Hare Ram Singh v. Reserve Bank of India & Ors., 2024). The court underscored the fiduciary duty of banks to protect customer interests, criticizing SBI's delayed response despite prompt reporting. It reaffirmed the RBI's 'Zero Liability' principle, emphasizing the need for banks to implement robust security measures (Sharma, 2025). The judgment reinforced the legal expectation for banks to act swiftly and responsibly in cyber fraud cases.

C. Consumer Court Orders Banks to Compensate in Online Fraud (2023)

Consumer courts across India ordered banks to compensate victims for online fraud losses, reinforcing the 'Zero Liability' principle under RBI guidelines (ET Online, 2023). These rulings

emphasized the importance of prompt reporting and bank accountability, pushing banks to improve cybersecurity infrastructure and customer education (ET Online, 2023).

D. CBI's Case Against Shri Lakshmi Cotsyn Ltd for ₹6,833 Crore Fraud (2021)

The case against Shri Lakshmi Cotsyn Ltd represents one of the largest corporate bank frauds in India (Pandey, 2023). The company was accused of diverting loans and falsifying financial records, leading to extensive investigations by CBI and ED (Pandey, 2023). This case highlights the challenges of monitoring large corporate loans, corporate governance lapses, and the need for stringent due diligence (Pandey, 2023).

E. Supreme Court's Judgment in SBI v. Rajesh Agarwal (2021)

The Supreme Court clarified that COVID-19 cannot be used as a defense for pre-existing fraudulent conduct (State Bank of India and Others vs. Rajesh Agarwal and Others, 2023). It emphasized that systemic vulnerabilities exposed during the pandemic must be addressed through strengthened due diligence and regulatory oversight. The ruling underscored the importance of fair classification procedures and the rights of borrowers.

Legal and Regulatory Trends

The judiciary's approach during this period has emphasized accountability, consumer rights, and the importance of timely response. Courts have reinforced RBI guidelines on customer liability, cybersecurity standards, and dispute resolution mechanisms. The judgments collectively advocate for more robust security infrastructure, real-time fraud detection, and proactive compliance.

The judiciary's approach during this period has marked a significant shift towards emphasizing accountability, consumer protection, and the importance of prompt and effective response mechanisms in the realm of banking and digital transactions. Courts across India, in their rulings related to cyber fraud and unauthorized transactions, have consistently reinforced the necessity for banks to adhere strictly to regulatory guidelines issued by the Reserve Bank of India (RBI) and other relevant authorities. These judicial pronouncements underscore that banks are not merely service providers but custodians of customer trust and assets, with a legal obligation to ensure the security of digital banking channels. The courts have been particularly critical of lapses in cybersecurity infrastructure, delayed responses to fraud reports, and inadequate grievance redressal mechanisms, framing these failures as violations of consumer rights and breaches of regulatory compliance.

One of the most prominent trends emerging from recent judgments is the reaffirmation of the RBI's guidelines on customer liability and fraud reporting. The judiciary has underscored that the principles enshrined in these guidelines are not voluntary but binding obligations that banks

must follow diligently. For instance, courts have emphasized that when customers report unauthorized transactions within the stipulated timeframe—typically within three working days—they should not be held liable for the fraudulent losses, provided they have acted promptly and without negligence. This reinforces the legal doctrine of “zero liability” for customers, which aims to protect consumers from bearing the brunt of cybercriminal activities that banks have failed to prevent or detect in time. Such judgments have created a legal imperative for banks to establish transparent, accessible, and efficient systems for reporting, investigating, and resolving cyber frauds swiftly, thereby aligning operational practices with judicial expectations.

Furthermore, courts have increasingly directed banks to strengthen their cybersecurity standards, emphasizing that mere compliance with existing norms is insufficient in the face of evolving cyber threats. The judiciary’s stance is clear: banks must proactively adopt advanced security measures, including multi-factor authentication, biometric verification, encryption technologies, intrusion detection systems, and real-time transaction monitoring. Such measures are essential not only for preventing unauthorized access but also for enabling early detection of suspicious activities. Courts have also called for continuous risk assessments and audits to identify vulnerabilities before they are exploited, reflecting a move towards a more preventive approach rather than reactive measures after a breach occurs. This judicial insistence on robust security infrastructure signals a paradigm shift, compelling banks to view cybersecurity as a core component of their risk management framework rather than a compliance checkbox.

In addition to emphasizing technological safeguards, the judiciary has highlighted the importance of establishing comprehensive dispute resolution mechanisms that are accessible, prompt, and transparent. Courts have acknowledged that victims of cyber fraud often face prolonged legal battles and inadequate redressal avenues, which erode trust in the banking system. As a result, they have directed regulatory authorities and banks to create dedicated grievance channels, including digital portals, helplines, and instant complaint registration systems, capable of dealing with cyber frauds efficiently. The courts have also underscored the need for banks to maintain detailed records of transactions, security protocols, and customer interactions, which can serve as vital evidence in legal proceedings. This approach aims to foster a more accountable banking environment where customer complaints are addressed swiftly, and the banks’ liability is clearly established and enforced when lapses occur.

Finally, these legal and judicial trends are exerting pressure on regulators to tighten the regulatory framework governing digital banking and cybersecurity. Courts have called for the development of clearer, more stringent standards that keep pace with technological advancements and emerging cyber risks. This includes not only compliance with technical norms

but also the institutional capacity to enforce them effectively. As a result, policymakers and regulators are being encouraged to augment existing regulations with detailed operational guidelines, periodic compliance audits, and mandatory reporting of cyber incidents. The judiciary's consistent reinforcement of regulatory compliance acts as a catalyst for creating a more resilient financial ecosystem, where banks are held accountable for their security posture and are incentivized to invest in continuous improvement. Moreover, this trend signals a move towards greater integration of legal accountability with technological safeguards, ensuring that the regulatory environment evolves dynamically alongside cyber threats.

Thus, the recent legal and regulatory trends reflect a clear judicial mandate for banks to elevate their cybersecurity standards, streamline grievance redress mechanisms, and adhere strictly to regulatory guidelines. Courts have played a pivotal role in shaping a legal environment that prioritizes consumer protection, accountability, and proactive compliance. These developments are expected to drive banks towards adopting more sophisticated technological solutions, embedding compliance into their strategic planning, and fostering a culture of transparency and responsibility. As cyber threats continue to evolve, the judiciary's insistence on robust legal and regulatory frameworks will remain instrumental in ensuring that the banking sector remains resilient, trustworthy, and aligned with the principles of fair practice and consumer rights in the digital age.

Implications for Banking Sector

These legal trends motivate banks to prioritize cybersecurity, improve customer grievance redressal, and adhere strictly to regulatory norms. Failure to do so could lead to increased legal liabilities, reputational damage, and erosion of customer trust. The judiciary's stance also encourages policymakers to strengthen regulatory frameworks and enforce stricter compliance standards.

The evolving legal landscape surrounding banking frauds during and after the COVID-19 pandemic has profound implications for the banking industry. Judicial pronouncements and regulatory directives have underscored the importance of proactive risk management, robust cybersecurity infrastructure, and customer-centric policies. These developments serve as both a warning and a guiding framework for banks to adapt their operations, compliance mechanisms, and governance structures to meet new legal expectations and protect themselves from future liabilities.

A. Strengthening Cybersecurity Infrastructure

One of the most immediate and critical implications of these legal trends is the urgent need for banks to overhaul and fortify their cybersecurity infrastructure. The judiciary's emphasis on

accountability and prompt response in cases of cyber fraud signals that banks cannot afford to adopt a passive or reactive stance towards digital security.

Banks must invest in advanced cybersecurity technologies, including multi-factor authentication, biometric verification, encryption, intrusion detection systems, and real-time fraud monitoring tools. These technological safeguards serve as the first line of defense against cyber threats and help in preventing unauthorized access, data breaches, and fraudulent transactions. The legal rulings highlight that failure to implement such measures can lead to significant liabilities, as courts have increasingly held banks accountable for lapses that facilitate fraud.

Furthermore, continuous security audits, vulnerability assessments, and penetration testing should become integral to banks' operational protocols. By proactively identifying weaknesses, banks can prevent breaches before they occur and demonstrate compliance with evolving legal standards. This proactive approach is essential not only for safeguarding customer assets but also for mitigating legal risks and avoiding reputational damage.

B. Enhancing Customer Grievance Redressal Mechanisms

Another vital implication pertains to customer grievance redressal systems. The judiciary's rulings have reinforced the principle that banks are responsible for responding swiftly and effectively to customer complaints related to cyber frauds. Delayed or inadequate responses can result in legal liabilities, financial penalties, and loss of customer trust.

Banks must, therefore, revamp their grievance redressal mechanisms to ensure they are accessible, transparent, and efficient. This involves establishing dedicated cyber fraud helplines, deploying AI-powered chatbots for immediate assistance, and creating streamlined procedures for reporting suspicious activities. Regular training of customer service staff on handling cyber fraud complaints is essential to ensure prompt and empathetic responses.

Moreover, banks should implement automated alerts for suspicious transactions and provide easy-to-understand guidance to customers on protective measures. Educating customers about safe banking practices, such as recognizing phishing attempts and maintaining confidentiality of credentials, can significantly reduce fraud incidents and demonstrate the bank's commitment to customer protection.

Legal trends have also underscored the importance of timely communication and resolution. Courts have emphasized that a delay in response or failure to act upon a fraud report can constitute negligence, leading to legal liabilities. As a result, banks must integrate compliance with these judicial expectations into their operational policies, ensuring that all fraud-related complaints are addressed within prescribed timeframes.

C. Adherence to and Enforcement of Regulatory Norms

The judiciary's increasing focus on compliance and accountability exerts pressure on regulators like the Reserve Bank of India (RBI) to tighten regulations and enforce stricter standards. This, in turn, compels banks to align their internal policies with these evolving norms.

Banks are now expected to adhere rigorously to RBI guidelines on cybersecurity, fraud prevention, and customer protection. This includes implementing the prescribed control measures, maintaining adequate infrastructure, and ensuring operational resilience. For instance, RBI's Master Directions on Digital Payments and Cybersecurity Framework outline essential controls and reporting obligations, which banks must incorporate into their compliance programs.

Failure to comply with these norms can result in legal penalties, sanctions, and increased scrutiny by regulators. Moreover, courts have shown a willingness to interpret regulatory guidelines as legally binding standards, holding banks liable for non-compliance in cases of negligence or lapses leading to customer losses.

To meet these expectations, banks should establish comprehensive compliance management systems, conduct regular internal audits, and engage in continuous staff training on legal and regulatory requirements. They should also maintain detailed documentation of cybersecurity measures, risk assessments, and incident response protocols to demonstrate diligent adherence during audits and legal proceedings.

D. Corporate Governance and Risk Management

The legal trends underscore the importance of sound corporate governance and risk management practices. Banks must strengthen their internal controls to prevent fraud and ensure accountability at all levels of operations.

This involves establishing clear policies and procedures for credit approval, loan monitoring, and transaction authorization. It also requires creating a culture of transparency and ethical behavior, with regular oversight by the board of directors and risk committees. The judiciary's emphasis on accountability encourages banks to adopt a zero-tolerance approach towards lapses that contribute to fraud.

Additionally, banks should develop robust audit and compliance frameworks to identify and address vulnerabilities proactively. This includes integrating risk management into strategic planning and leveraging data analytics to detect anomalies and potential frauds early.

E. Reputational and Financial Risks

Legal judgments that impose liabilities for lapses in cybersecurity or customer protection can have significant reputational and financial repercussions. Negative publicity resulting from court

rulings or regulatory sanctions can lead to loss of customer confidence, declining deposits, and declining market share.

Financially, banks may face hefty penalties, compensation payouts, and increased insurance premiums. The cumulative effect of legal liabilities and reputational damage could threaten their stability and sustainability.

Hence, financial institutions must prioritize building a resilient risk management framework that minimizes exposure to legal liabilities. This includes investing in insurance against cyber risks, maintaining adequate capital buffers, and establishing crisis communication strategies to manage public perception during adverse events.

E. Policy and Regulatory Engagement

The judiciary's stance on banking frauds acts as a catalyst for policymakers to strengthen the regulatory environment. Banks are expected to actively engage with regulators in shaping policies that address emerging cyber threats and fraud risks.

This engagement involves participating in consultation processes, providing feedback on draft regulations, and advocating for clear, enforceable standards. Banks should also invest in developing internal policy frameworks aligned with national cybersecurity strategies and international best practices.

Moreover, compliance with evolving legal standards necessitates continuous monitoring of regulatory updates, participation in industry forums, and collaboration with cybersecurity agencies and law enforcement. Such proactive engagement ensures that banks are not only compliant but also prepared to adapt swiftly to new threats and legal requirements.

F. Training and Capacity Building

An often-overlooked but crucial implication is the need for sustained training and capacity building within banking organizations. As cyber threats become more sophisticated, staff at all levels must remain alert and knowledgeable about emerging risks, regulatory obligations, and best practices.

Regular training programs on cybersecurity awareness, fraud detection, and legal compliance are essential. This helps in creating a culture of vigilance and responsibility, minimizing human errors that often serve as entry points for cybercriminals.

Furthermore, specialized training for compliance officers, cybersecurity personnel, and customer service teams will enable banks to respond effectively to incidents and reduce the likelihood of legal liabilities.

G. Embracing Technological Innovation

The legal trends underline the importance of leveraging technological innovations for fraud prevention and customer protection. Banks are encouraged to adopt emerging technologies such as artificial intelligence, blockchain, biometric authentication, and machine learning.

AI and machine learning algorithms can analyze vast amounts of transaction data to identify suspicious patterns and trigger alerts for potential frauds. Blockchain technology offers transparent and immutable transaction records, reducing the risk of tampering and fraudulent modifications.

Biometric authentication methods, like fingerprint and facial recognition, enhance security for digital banking channels. These technologies not only prevent unauthorized access but also demonstrate compliance with legal standards for safeguarding customer data.

Conclusion

The COVID-19 pandemic has acted as a catalyst in reshaping the judicial landscape surrounding banking frauds in India. Courts have increasingly held banks accountable for lapses and emphasized consumer protection, reinforcing the principles of responsible digital banking. The evolving jurisprudence underscores the necessity for banks to adopt robust cybersecurity measures, streamline fraud detection, and ensure prompt redressal of customer grievances. The recent legal and regulatory trends reflect a clear judicial mandate for banks to elevate their cybersecurity standards, streamline grievance redress mechanisms, and adhere strictly to regulatory guidelines.

Courts have played a pivotal role in shaping a legal environment that prioritizes consumer protection, accountability, and proactive compliance. These developments are expected to drive banks towards adopting more sophisticated technological solutions, embedding compliance into their strategic planning, and fostering a culture of transparency and responsibility. As cyber threats continue to evolve, the judiciary's insistence on robust legal and regulatory frameworks will remain instrumental in ensuring that the banking sector remains resilient, trustworthy, and aligned with the principles of fair practice and consumer rights in the digital age. Moving forward, a collaborative effort involving regulators, financial institutions, and judicial bodies is essential to fortify the digital banking ecosystem against emerging threats. These trends not only safeguard customer interests but also foster a resilient financial system aligned with technological advancements.

References

1. ET Online (2023). Bank must refund money to customer for reported online fraud: Court, *Economic Times*. <https://m.economictimes.com/industry/banking/finance/banking/bank-must-compensate-customer-for-reported-online-fraud-court/articleshow/104719022.cms>
2. Hare Ram Singh v. Reserve Bank of India & Ors., [2024:DHC:8816]
3. Marcu, M. R. (2021). The impact of the COVID-19 pandemic on the banking sector. *Management Dynamics in the Knowledge Economy*, 9(2), 205-223.
4. Oladinni, A., & Odumuwan, O. O. (2025). Enhancing cybersecurity in fintech: safeguarding financial data against evolving threats and vulnerabilities. *International Journal of Computer Applications Technology and Research*, 14(1), 62-78.
5. Pandey, D.K (2023), CBI registers case for ₹6,833.82 cr. alleged bank fraud, *The Hindu*, <https://www.thehindu.com/news/national/cbi-registers-case-for-683382-cr-alleged-bank-fraud/article35788794.ece>.
6. Sharma, B. (2025), THE ZERO LIABILITY PRINCIPLE IN CYBER FRAUD: A CASE STUDY OF HARE RAM SINGH V. RESERVE BANK OF INDIA & ORS, *CYBER LAW: SERIES 2: ISSUE 10, MCO Legals*. https://www.mcolegals.in/kb/Cyber_Law-Series_2-Issue_10_-_The_Zero_Liability_Principle_in_Cyber_Fraud_-_Hare_Ram_Singh_v.pdf
7. Shpachuk, V., Markova, O., & Adamyk, B. (2026). AI-driven financial fraud: key risks and legal protections for financial institutions. *Journal of Banking Regulation*, 27(1), 6.
8. Shrivastava, A., (2024, June 14), Bombay High Court Orders Bank of Baroda To Refund Rs 76 Lakh, Says Account Holder Not Liable For Unauthorized Transactions Due To Third Party Breach, *Live Law*, <https://www.livelaw.in/high-court/bombay-high-court/bombay-high-court-bank-of-baroda-cyber-fraud-refunds-76-lakh-account-holder-not-liable-260559>
9. State Bank of India and Others vs. Rajesh Agarwal and Others, (2023) 6 SCC 1
10. Zamil, M. H., & Faruq, M. O. (2022). Cybersecurity And Data Integrity in Financial Systems: A Review Of Risk Mitigation And Compliance Models. *International Journal of Scientific Interdisciplinary Research*, 1(01), 27-61.

A CRITICAL ANALYSIS OF ONLINE DATING

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Introduction

According to Oxford dictionary online dating is the practice of searching for a romantic or sexual partner on the internet, typically via website

Examples

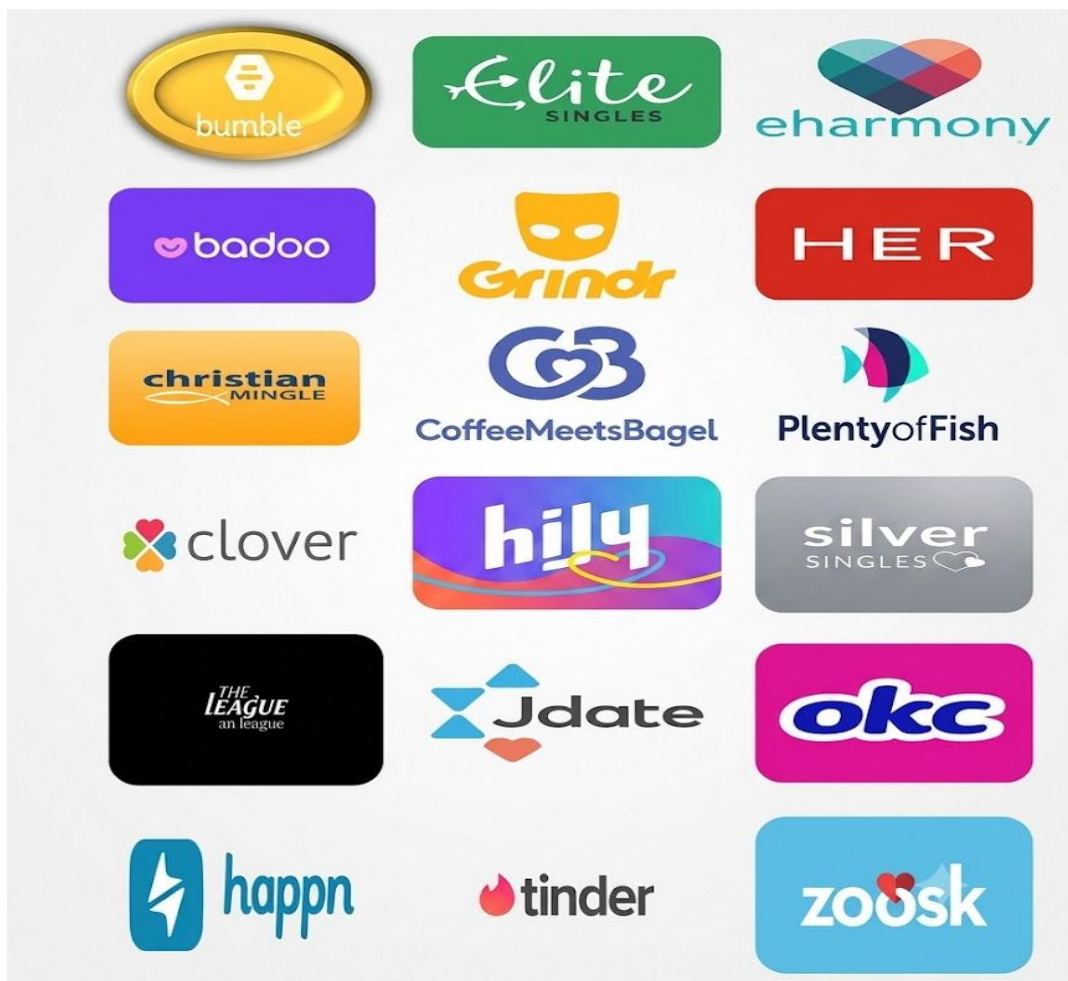
- An online dating platform (also known as a dating website) is a web-based system to facilitate contact between people who are interested in each other.
- Online dating platforms are called “matchmaking” sites and provide social networking services.
- These platforms are usually free to use, but they often have features such as swipe-based matchmaking and the ability to send more sophisticated messages than simple text messaging or email.
- The landscape in which people meet to form relationships has changed dramatically in the past 15 years.
- Traditional methods such as the workplace, the nightclub, friends of friends and family friends have been augmented by the internet.
- Before the invention of the internet in the mid 1990’s there was a section in the print media, newspapers and magazines for the classified personal ads, also known as the “lonely hearts column” which gave individuals a chance to advertise themselves in the hope of meeting someone to form a relationship with.

A Timeline of the History of Online Dating

- 1685: The first known personal ads are published
- 1700s: Gay Singles begin to place ads with code words
- 1727: Helen Morrison becomes the first woman to place an ad

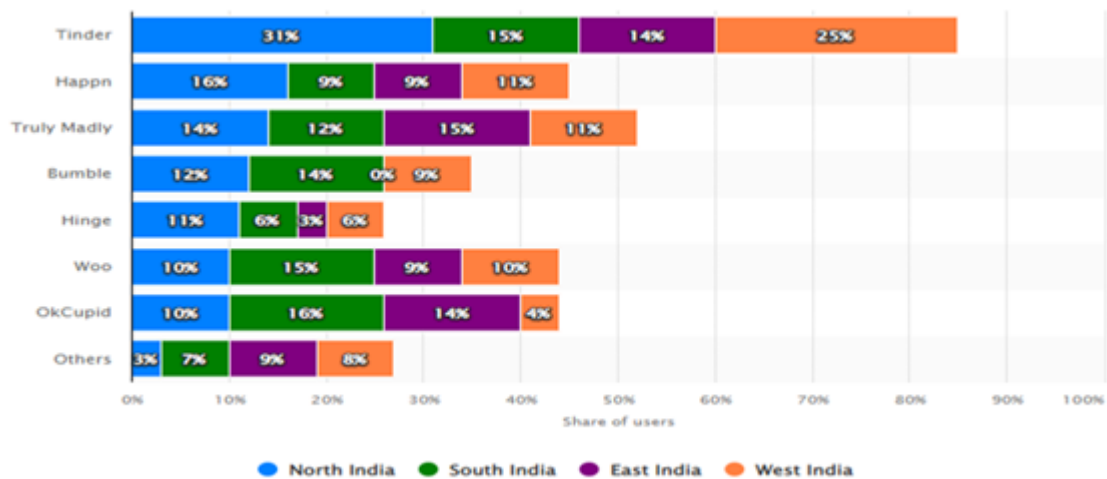
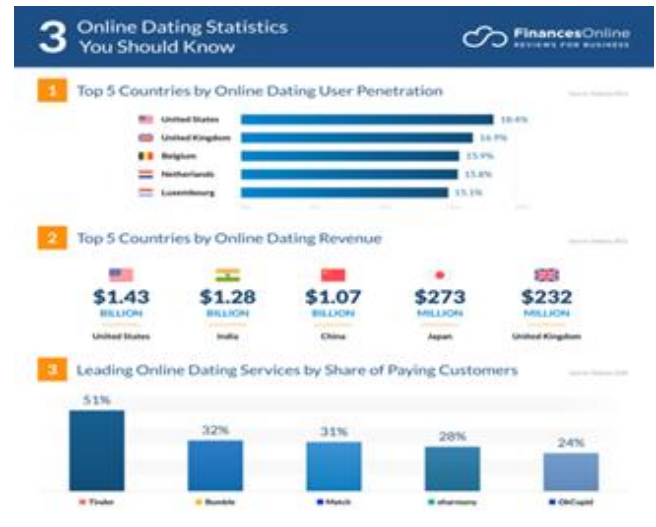
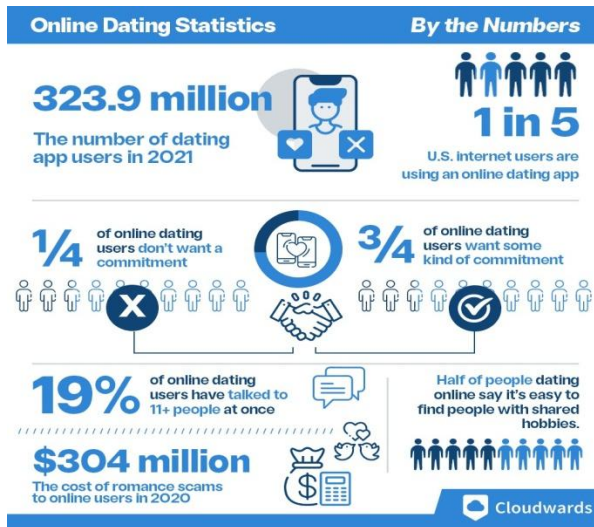
- 1800s: This process grows popular — From upper to lower classes
- 1870: The Matrimonial News is the first publication just for singles
- Early 1900s: Soldiers fighting in WWI seek companionship
- 1940: Introduction is the first company to use data to match people
- 1959: Stanford students create an automated matchmaking service for a school project
- 1965: Operation match becomes the first computer dating service
- 1990s: Creation of the internet takes personal ads to the next level
- 1995: Match.com launches as the first online dating site
- 1998: “You’ve Got Mail” premieres & makes online dating a household term
- 2000: Eharmony is founded with a focus on serious relationships
- 2004: OkCupid & its unique questionnaire hit the web
- 2007: Smartphones are introduced & help launch dating apps like Zoosk
- 2012: Tinder becomes the first dating app to use the swiping matching system
- Today: Over 49 million people have used online dating & about 8,000 sites exist

Leading Online Dating Sites



Global Perspective

- Since 2016, there were 240.9 million dating app users worldwide
- In 2021, that number jumped up to 323.9 million.
- Nearly 19.00% of internet users in the United States claimed they were currently using an online dating app or platform.
- According to Pew Research, 55.00% of LGBTQ adults said they have used a dating app, compared to 28.00% of straight adults.
- Around 42.00% of users aim for marriage by using online dating sites.



Indian Perspective

- According to online global data aggregator Statista.com, the online dating segment's turnover in India is expected to reach \$783 million by 2024 from \$454 million in 2021, making the country the second-largest national revenue generator for dating apps after the U.S.

- During the pandemic, the dating app market grew phenomenally as millions stayed home, and the country saw its internet user base explode, with plummeting data costs.
- Currently, dating apps reach 2.2% of India's total population, with projections of 3.6% by 2024, according to industry surveys.
- Aisle achieved 3 million downloads worldwide last year despite competition from formidable U.S. brands such as Tinder and Bumble.
- QuackQuack, an Indian dating app launched in 2010, boasts 12 million users with nearly 15 million chat exchanges per month.
- TrulyMadly, another Indian app, claims 5 million users with over 1 million message exchanges daily.

Stages of Online Dating

1. Joining

- The first stage of online dating is choosing which dating app or site to use.
- While every dating app guides you through the process of creating a profile and presents you with potential partners, each app works slightly differently and is designed for specific purposes. For example, Tinder is infamously used to find hookups (Mateo, 2020).

2. Creating a Profile

- In order to start using online dating apps, you must first make a profile.
- A basic profile includes a few photos of you and a short bio with some of your interests or beliefs.
- But different dating apps have unique approaches to profiles. For example, many people on Tinder choose to just put pictures of themselves in their profile and skip the bio altogether. (Mateo, 2020).

3. Searching/Swiping

- After creating a profile, the next stage is selecting people you're interested in.
- Tinder was the first app to use right and left swiping to sort through people's profiles (Stampler, 2014).
- A left swipe equals a rejection while a right swipe equals interest in that person.
- Other popular dating apps, such as Bumble and Plenty of Fish, have since added swiping to their platforms (Mateo, 2020).

4. Matching

- When you match with someone, it means you both like each other.

- Some apps find matches for you automatically based on an algorithm while others leave it up to two users to swipe right on each other (Mateo, 2020).
- Each app has different free and premium features, but you usually can't message someone until you've matched with them.

5. Messaging

- After you match with someone, the messaging begins. On most dating apps, either person can message first.
- In addition to messaging in the app, some people choose to contact their matches on other social media platforms like Snapchat, Instagram, or Facebook.

6. Meeting in Person

- After messaging, the next stage of online dating is usually meeting in person.
- This is because most dating apps have location settings that keep potential matches in your area, and most people want to get off apps and transition to an in-person relationship.
- However, some people may start out in a long-distance relationship if their dating app allows them to expand their radius worldwide.

7. Follow-up Dates

- If the first date goes well, the next stage of online dating is going on more dates! This stage overlaps with traditional in-person dating.
- On these dates, you and your match will get to know each other better and explore each other's beliefs to see if you would make a good couple.
- Many relationships start online and end in this stage after people find they are not compatible and return to their familiar dating apps to find more potential partners.

8. Making it Official

- The final stage of online dating is getting into an official relationship with your match.
- This is many people's ultimate goal when they sign up for online dating.
- Most people delete their dating apps at this stage unless they're in an open or polyamorous relationship.

Advantages

- Online dating is quite convenient
- Huge variety of potential partners
- You don't have to dress up for online dating
- Dating online may take away some of your insecurities

- You may be more relaxed in your own home
- You can do online dating from almost everywhere
- Fear of rejection may be lower
- You can date more partners at the same time
- It is useful for LGBT users to find partners.

Disadvantages

- Online dating may attract the wrong types of partners
- People often don't look like on their pictures.
- Online dating is rather shallow
- You can't see the reaction of the other person
- Success in online dating greatly depends on looks
- Online dating can be costly
- Fake profiles are a problem of online dating.
- People may insult you
- You don't know what intention the person really has.
- People will lie regarding their dating profiles

Impact of Online Dating on Mental Health

1. Increased Levels of Psychological Distress

- In early 2020, the pew research center published the results of a study about online dating in America.
- 45% of users reported that online dating left them feeling more frustrated than hopeful.
- 60% of women aged 18-34 say someone on a dating app continued to contact them after they said they were not interested.
- 57% report that another user sent them an unwanted sexually explicit message or image.
- 19% say they have had someone threaten physical harm

2. Rejection is a Self-Esteem Killer

- Rejection is a fact of life. There are more than 7 billion people on the planet and not all of them are going to like you.

Emotional / Psychological Consequences of Rejection Includes:

- Hurt feelings, Jealousy, Loneliness, Guilt / shame, Social anxiety, Embarrassment, Sadness, Anger

3. Deceptive Behavior Leads to Trust Issues

Deceptive behavior in online dating—such as using misleading profile photos or lying about personal details—erodes trust and creates lasting emotional barriers, making users hesitant to open up to future connections.

4. Online dating apps might be addictive

- Internet addiction is a serious matter, worldwide, it is estimated that 6% of the population, or 470 million people, struggles with it
- According to Survey conducted by Match.com, men were (97.00%) more likely to feel addicted to dating than women.
- 15% of users say they feel addicted to the process of looking for a date.

References

1. Babitha, B., Patil, P., & Jhansi, B. (2023). *A critical analysis of online dating*. Department of Human Development and Family Studies, College of Community Science.
2. Cloudwards. (2021). *Online dating statistics: By the numbers, trends, and revenue*. Cloudwards Research.
3. FinancesOnline. (2021). *Online dating statistics you should know: User penetration, revenue, and leading services*. FinancesOnline Reviews for Business.
4. Match.com. (2020). *Singles in America: Annual survey on relationship trends and dating app behavior*. Match Group.
5. Mateo, J. (2020). *The behavioral architecture of swipe-based matchmaking apps*. Psychological Press.
6. Oxford University Press. (n.d.). Online dating. In *Oxford English Dictionary*. Oxford University Press.
7. Statista. (2019). *Share of dating application users across India in 2018, by region* [Data set]. Statista Research & Analysis.
8. Statista. (2021). *Online dating market turnover and penetration projections in India (2021–2024)* [Data set]. Statista Research & Analysis.
9. Stampler, L. (2014, February 6). Inside Tinder: Meet the guys who turned dating into a digital addiction. *Time Magazine*.
10. Vogels, E. A., & Anderson, M. (2020). *The virtues and downsides of online dating in America*. Pew Research Center.

ARTIFICIAL INTELLIGENCE AND THE FUTURE OF EMPLOYMENT IN INDIA: ECONOMIC OPPORTUNITIES, CHALLENGES, AND POLICY IMPLICATIONS

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Abstract:

Artificial Intelligence (AI) is emerging as a transformative technology with far-reaching implications for economies, industries, and labor markets across the globe. In India, the rapid adoption of AI-driven technologies in sectors such as manufacturing, information technology, finance, healthcare, retail, and education is reshaping the nature of work and employment patterns. While AI has the potential to enhance productivity, foster innovation, and create new economic opportunities, it also raises concerns regarding job displacement, skill obsolescence, income inequality, and workforce adaptation. This chapter examines the evolving relationship between artificial intelligence and employment in the Indian context, highlighting both its opportunities and challenges. The chapter adopts a qualitative and exploratory approach based on an extensive review of existing literature, policy reports, government publications, and industry analyses. It explores how AI contributes to economic growth through automation, improved decision-making, operational efficiency, and the creation of new occupations requiring advanced digital and analytical skills. At the same time, it investigates the potential risks associated with technological unemployment, particularly among workers engaged in routine and repetitive tasks. Special attention is given to the impact of AI on different sectors of the Indian economy and the implications for labor market dynamics.

The chapter concludes that although artificial intelligence may disrupt traditional employment structures, it also presents significant opportunities for job creation, entrepreneurship, and economic advancement. A proactive policy approach focused on human capital development, social protection mechanisms, and inclusive technological adoption is essential to ensure that the benefits of AI contribute to equitable and sustainable economic development in India.

Keywords: Artificial Intelligence; Employment; Economic Growth; Skill Development.

1. Introduction

Artificial Intelligence (AI) has emerged as one of the most disruptive and transformative technologies of the twenty-first century, reshaping economies, industries, and labor markets

across the globe. The convergence of machine learning, deep learning, big data analytics, cloud computing, and automation technologies has accelerated the integration of AI into various sectors, including manufacturing, finance, healthcare, education, retail, agriculture, and public administration. As organizations increasingly rely on intelligent systems to improve efficiency, reduce operational costs, and enhance decision-making, AI has become a critical driver of innovation and economic growth.

The growing significance of AI is evident from its expanding contribution to national economies. According to a NASSCOM report, the adoption of artificial intelligence and data-driven strategies has the potential to add approximately US\$500 billion to India's Gross Domestic Product (GDP), making AI a significant catalyst for economic transformation. The report further highlights that sectors such as banking and financial services, healthcare, retail, and manufacturing are expected to account for nearly 60 percent of this economic value creation. Moreover, around 65 percent of Indian organizations have already developed AI strategies at either the functional or enterprise level, reflecting the increasing acceptance of AI technologies across industries.

The rapid diffusion of AI technologies has generated intense discussions regarding their impact on employment and the future of work. Historically, technological advancements have simultaneously created and displaced jobs. The Industrial Revolution mechanized physical labor, while the Information Technology revolution transformed knowledge-intensive work. AI represents a new phase of technological evolution because it possesses the capability to perform not only routine physical tasks but also complex cognitive functions such as language processing, pattern recognition, predictive analysis, and decision-making. Consequently, concerns have emerged regarding job displacement, workforce restructuring, skill obsolescence, and widening income inequality.

India occupies a unique position in this transformation due to its demographic advantage and large labor force. With a population exceeding 1.4 billion and a workforce of more than 500 million individuals, the country's economic future is closely linked to its ability to adapt to technological change. At the same time, India is emerging as a major global hub for AI talent. Recent reports indicate that India has more than 420,000 professionals working in AI-related roles and possesses one of the highest levels of AI skill penetration globally. The country's AI market is projected to reach approximately US\$17 billion by 2027, growing at an annual rate of 25–35 percent. Furthermore, demand for AI talent is expected to increase by nearly 15 percent annually, reflecting the growing need for specialized digital skills.

Evidence of this transformation can also be observed in hiring trends. According to LinkedIn's AI Labour Market Update, India recorded the fastest growth in AI engineering recruitment

globally, with AI hiring increasing by 59.5 percent year-on-year. This trend indicates that AI is not merely replacing jobs but is also generating new employment opportunities in areas such as machine learning engineering, data science, AI consulting, cybersecurity, cloud computing, and AI operations. Such developments suggest that the impact of AI on employment is complex and multidimensional, involving both job creation and job displacement.

The Indian information technology sector provides another illustration of this dual impact. While automation and generative AI are altering traditional service-delivery models, the industry continues to expand. Recent estimates indicate that India's IT industry has surpassed US\$300 billion in revenue and is expected to employ nearly 5.95 million professionals. Although AI is reducing the demand for certain routine tasks, it is simultaneously creating new opportunities for workers equipped with advanced digital competencies and analytical skills. This transformation underscores the growing importance of reskilling and upskilling initiatives in preparing the workforce for AI-driven economic change.

Despite these opportunities, significant challenges remain. A substantial proportion of India's workforce is employed in low-skilled and routine occupations that are vulnerable to automation. Workers lacking digital literacy and technological competencies may face increased risks of job displacement. Furthermore, the unequal distribution of AI-related skills and employment opportunities could exacerbate existing socioeconomic disparities between urban and rural regions, formal and informal sectors, and skilled and unskilled workers. These concerns highlight the need for comprehensive policy interventions aimed at promoting inclusive growth and ensuring that the benefits of AI are shared broadly across society.

In response to these developments, the Government of India has launched several initiatives, including Digital India, Skill India, Startup India, and the National Strategy for Artificial Intelligence, to strengthen digital infrastructure, promote innovation, and enhance workforce readiness. However, the successful integration of AI into the economy will depend on the effectiveness of policies related to education, labor market adaptation, social protection, digital inclusion, and ethical AI governance.

Against this backdrop, this chapter examines the implications of artificial intelligence for the future of employment in India. It explores the economic opportunities generated by AI adoption, analyzes the challenges associated with workforce transformation, and evaluates the policy measures necessary to ensure inclusive and sustainable development. By synthesizing existing literature, industry reports, and policy evidence, the chapter seeks to provide a comprehensive understanding of how AI is reshaping India's labor market and what strategies are required to maximize its benefits while minimizing its risks.

2. Literature Review

The existing literature presents mixed findings, suggesting that AI can simultaneously create opportunities and pose challenges for workers and economies.

One of the earliest influential studies in recent years was conducted by Acemoglu and Restrepo (2018), who examined the effects of automation and robotics on labor markets. Their findings indicated that increased automation could reduce employment opportunities and wages for workers engaged in routine tasks. The authors argued that technological progress often replaces labor in specific occupations before generating new employment opportunities, thereby creating short-term labor market disruptions. Their study highlighted the importance of policy interventions to facilitate workforce adaptation. Similarly, Brynjolfsson, Rock, and Syverson (2019) explored the relationship between AI and productivity growth. The authors argued that AI has the potential to significantly enhance productivity and economic performance; however, the benefits may not be immediately visible due to adjustment costs, organizational restructuring, and skill mismatches. Their research emphasized that AI should be viewed as a complementary technology that augments human capabilities rather than merely replacing workers.

A comprehensive review by Lane and Saint-Martin (2021) for the Organisation for Economic Co-operation and Development (OECD) examined the impact of AI on employment, wages, skills, and working conditions. The authors concluded that AI is more likely to transform jobs than eliminate them entirely. According to their findings, occupations involving repetitive and routine tasks are more vulnerable to automation, whereas jobs requiring creativity, critical thinking, and interpersonal skills are likely to remain resilient. The study also emphasized the growing importance of digital literacy, lifelong learning, and workforce reskilling in adapting to AI-driven labor market changes. Further evidence was provided by Felten, Raj, and Seamans (2021), who developed an AI Occupational Exposure Index to assess the extent to which different occupations are exposed to AI technologies. Their study revealed that occupations involving information processing and analytical tasks are more likely to experience AI-related transformations. However, the authors found limited evidence of widespread job destruction, suggesting instead that AI changes the nature of work by altering task composition within occupations.

The distinction between job automation and job augmentation has become a major theme in recent literature. Autor (2022) argued that technological innovations historically tend to complement human labor rather than completely replace it. According to Autor, AI can enhance worker productivity by automating repetitive tasks and allowing employees to focus on higher-value activities. Nevertheless, he warned that workers lacking relevant skills may face difficulties adapting to technological changes, potentially leading to labor market polarization

and income inequality. A systematic review conducted by Filippi, Bannò, and Trento (2023) analyzed more than one hundred studies on automation and employment. The authors found that the impact of automation on employment varies across industries, occupations, and countries. While automation may reduce employment in routine-intensive sectors, it can also generate new jobs through innovation, productivity growth, and the emergence of new industries. Their findings suggest that labor market outcomes depend largely on institutional frameworks, workforce preparedness, and the pace of technological adoption.

The emergence of generative AI has further intensified discussions regarding the future of work. Eloundou, Manning, Mishkin, and Rock (2023) examined the potential labor market implications of large language models such as ChatGPT. Their study estimated that approximately 80 percent of workers could see at least 10 percent of their tasks affected by generative AI technologies. However, the authors emphasized that task exposure does not necessarily imply job loss, as AI may complement workers and improve productivity rather than replace them entirely. In the Indian context, research on AI and employment has gained significant attention in recent years. Banga and te Velde (2023) examined the implications of AI adoption for developing economies, including India. Their study highlighted that AI can contribute to economic growth, productivity enhancement, and industrial competitiveness. However, they also warned that developing countries face challenges related to skill shortages, digital infrastructure gaps, and unequal access to technological opportunities.

More recently, Behera and Nigam (2025) investigated the impact of automation and AI on India's labor market. Their study identified several challenges, including job displacement, skill mismatches, labor informality, and income inequality. The authors observed that AI-driven technological transformation is reshaping employment structures, particularly in sectors characterized by repetitive and routine tasks. At the same time, they found increasing demand for workers possessing AI-related competencies, digital literacy, and analytical skills. The study emphasized the need for educational reforms, workforce training programs, and supportive policy frameworks. Similarly, Khurshid (2025) analyzed the economic implications of AI adoption in India and found that AI is creating new employment opportunities in fields such as machine learning, data science, cybersecurity, cloud computing, and AI consulting. The study introduced the concept of a "skill-craft economy," where specialized technical and analytical skills become increasingly valuable. According to the author, workers equipped with advanced digital competencies are more likely to benefit from AI-driven economic transformation, whereas low-skilled workers remain vulnerable to displacement.

Another important area of research concerns labor market inequality and social inclusion. The International Labour Organization (ILO, 2024) reported that women are more likely than men to

be employed in occupations exposed to automation and AI technologies, particularly in administrative and clerical roles. The report warned that without targeted interventions, AI adoption could exacerbate existing gender disparities in employment. Similarly, studies by the World Economic Forum (2023) highlighted that workers in informal sectors and low-income groups face greater risks of exclusion from AI-driven economic opportunities due to limited access to education, digital infrastructure, and skill development programs.

Despite the growing body of literature, several research gaps remain. Therefore, effective policies focusing on education, reskilling, social protection, and inclusive technological adoption are essential to ensure that the benefits of AI contribute to sustainable and equitable economic development in India.

Research Gap

While previous studies have explored the effects of AI on productivity, automation, job displacement, and skill requirements, limited attention has been given to the unique challenges and opportunities associated with AI adoption in India's diverse economic and labor market environment. Furthermore, many studies focus on specific sectors or isolated aspects of AI-driven transformation, resulting in a fragmented understanding of its broader employment implications.

In addition, the rapid advancement of generative AI and intelligent automation technologies has created new employment dynamics that are not adequately addressed in earlier research. There is a need for a comprehensive and updated assessment that synthesizes evidence from academic literature, policy reports, government publications, and industry studies. Therefore, the present chapter adopts a qualitative and exploratory approach to examine the economic opportunities, employment challenges, and policy implications of artificial intelligence in India, thereby contributing to a more holistic understanding of the future of employment in the era of AI.

Objectives of the Study

- To examine the emerging role of Artificial Intelligence in transforming employment patterns in India.
- To explore the economic opportunities created by AI adoption across various sectors of the Indian economy.
- To identify the employment challenges and risks associated with AI-driven automation and technological change.
- To analyze the implications of AI for workforce skills, employability, and labor market dynamics.
- To suggest policy measures for promoting inclusive and sustainable employment growth in the age of Artificial Intelligence.

3. Research Methodology

- **Nature of Study:** The present study adopts a qualitative and exploratory research design to examine the implications of Artificial Intelligence (AI) for the future of employment in India.
- **Source of Study:** The study is based entirely on secondary data collected from a wide range of sources, including peer-reviewed journal articles, books, government reports, policy documents, industry publications, and reports from national and international organizations such as NASSCOM, the International Labour Organization (ILO), the Organisation for Economic Co-operation and Development (OECD), the World Bank, and the Ministry of Electronics and Information Technology (MeitY), Government of India. Recent industry analyses and research reports were also reviewed to capture contemporary developments in AI adoption and employment trends.
- **Research Analysis:** The collected information was analyzed using thematic analysis. Relevant literature and secondary sources were systematically reviewed and categorized into key themes, including AI-driven job creation, automation and job displacement, workforce skill transformation, labor market inequalities, and policy responses.
- **Scope of the Study:** It is limited to examining the economic and employment-related implications of AI within the Indian context. As the study relies exclusively on secondary data, its findings are dependent on the availability, reliability, and interpretation of existing literature and published reports. Nevertheless, the study provides valuable insights into the evolving relationship between AI and employment and offers a foundation for future empirical research in this area.

4. AI and Employment: Theoretical Perspectives

- **Technological Change Theory:** Technological Change Theory suggests that technological innovation serves as a key driver of economic growth and productivity enhancement. Advancements in technology enable firms to produce goods and services more efficiently, reduce production costs, and improve competitiveness. In the context of AI, technologies such as machine learning, automation, robotics, and data analytics are transforming production processes and organizational operations across industries. Therefore, AI can be viewed as a catalyst for economic transformation that reshapes rather than completely eliminates employment.
- **Skill-Biased Technological Change Theory:** The Skill-Biased Technological Change (SBTC) theory argues that technological advancements tend to increase the demand for highly skilled workers while reducing the demand for workers engaged in routine and repetitive activities. In the Indian context, the growing adoption of AI is expected to increase demand for professionals in areas such as data science, machine learning,

cybersecurity, and digital technology management. At the same time, workers lacking digital competencies may face challenges in adapting to changing labor market requirements, potentially contributing to wage disparities and employment polarization.

- **Schumpeter's Theory of Creative Destruction:** Joseph Schumpeter's Theory of Creative Destruction provides another important perspective on the relationship between innovation and employment. According to Schumpeter, economic development occurs through continuous cycles of innovation that replace outdated technologies, business models, and production systems with more efficient alternatives. Although this process may lead to the decline of certain industries and occupations, it simultaneously creates new markets, enterprises, and employment opportunities. AI represents a contemporary example of creative destruction, as it transforms traditional business practices while generating demand for new products, services, and skill sets. The theory suggests that short-term disruptions in employment should be viewed within the broader context of long-term economic progress and structural transformation.
- **Human Capital Theory:** Human Capital Theory emphasizes the importance of education, skills, training, and knowledge in determining individual productivity and employability. As AI reshapes workplace requirements, the value of human capital becomes increasingly significant. Workers who invest in acquiring digital skills, technological expertise, and lifelong learning capabilities are better positioned to benefit from emerging employment opportunities. Conversely, individuals lacking access to education and skill development may face difficulties adapting to technological change.

5. Economic Opportunities of AI in India

- **Enhancing Productivity and Operational Efficiency:** AI-powered systems can process vast amounts of data, automate repetitive tasks, and support real-time decision-making, enabling organizations to optimize resources and reduce operational costs. Businesses increasingly utilize AI for predictive analytics, customer relationship management, supply chain optimization, fraud detection, and process automation. Such applications allow firms to improve service quality, enhance competitiveness, and achieve higher levels of productivity.
- **Contribution to Economic Growth:** As industries adopt intelligent technologies, efficiency gains and innovation can stimulate production, investment, and competitiveness. AI-driven solutions support the development of new products, services, and business models, thereby expanding economic activity. The integration of AI into various sectors is expected to strengthen India's position in the global digital economy and enhance its capacity to attract domestic and foreign investment.

- **Creation of New Employment Opportunities:** The expansion of AI technologies has increased demand for professionals specializing in data science, machine learning, artificial intelligence engineering, cloud computing, cybersecurity, business analytics, and digital transformation. Organizations require skilled personnel to design, develop, implement, monitor, and maintain AI systems. Additionally, new occupations related to AI ethics, governance, regulatory compliance, and human-machine collaboration are gradually emerging.
- **Promoting Innovation and Entrepreneurship:** The availability of digital infrastructure, cloud platforms, and data-driven technologies has enabled startups to develop innovative solutions in healthcare, financial technology, agriculture, education, logistics, and e-commerce. AI-driven startups are introducing products and services that address diverse social and economic challenges, ranging from precision agriculture and telemedicine to digital payments and personalized learning platforms. The growth of the startup ecosystem not only stimulates innovation but also generates direct and indirect employment opportunities.

6. Sectoral Opportunities of AI

- **Information Technology and Business Services:** India's information technology sector is at the forefront of AI adoption. IT companies are increasingly integrating AI into software development, customer support, business process management, and digital consulting services. AI-driven solutions enable organizations to automate routine processes, improve service delivery, and create value-added offerings for clients. As a result, demand for AI professionals and technology specialists continues to grow within the sector.
- **Healthcare:** In the healthcare sector, AI is improving diagnostic accuracy, disease prediction, medical imaging, and patient management. Intelligent systems assist healthcare professionals in analyzing medical data and identifying treatment options more efficiently. The expansion of AI-enabled healthcare services creates opportunities for technology developers, healthcare analysts, and digital health specialists while improving access to quality healthcare services.
- **Financial Services:** The banking and financial services sector has widely adopted AI for fraud detection, credit assessment, risk management, customer service, and financial forecasting. AI-powered applications enhance operational efficiency and support data-driven decision-making. The increasing use of digital financial technologies has generated demand for professionals skilled in financial analytics, cybersecurity, and AI-based financial services.

- **Manufacturing:** AI-driven automation and smart manufacturing technologies are transforming industrial production processes. Intelligent systems facilitate predictive maintenance, quality control, inventory management, and production optimization. These innovations improve productivity and competitiveness while creating demand for workers capable of operating and managing advanced manufacturing technologies.
- **Agriculture:** Agriculture remains a crucial sector of the Indian economy, and AI offers considerable opportunities for improving agricultural productivity and sustainability. AI applications support crop monitoring, weather forecasting, pest detection, soil analysis, and precision farming practices. These technologies enable farmers to make informed decisions, optimize resource utilization, and enhance agricultural output. The growing adoption of digital agriculture solutions also creates opportunities for agri-tech enterprises and technology service providers.
- **Education:** AI is transforming education through personalized learning systems, intelligent tutoring platforms, and adaptive assessment tools. Educational institutions increasingly utilize AI to enhance teaching effectiveness and improve learning outcomes. The expansion of educational technology creates opportunities for content developers, instructional designers, data analysts, and digital learning specialists.
- **Strengthening India's Global Competitiveness:** AI adoption has the potential to strengthen India's position in the global economy by enhancing innovation, productivity, and technological capabilities. As countries increasingly compete in the digital era, investments in AI research, development, and talent creation can enable India to emerge as a leading technology hub. The country's large pool of technical talent, expanding digital infrastructure, and growing startup ecosystem provide a strong foundation for leveraging AI-driven opportunities. By fostering innovation and supporting workforce development, AI can contribute to sustainable economic growth and improved living standards.

7. Employment Challenges and Risks

- **Job Displacement and Automation:** AI-powered systems can perform repetitive, predictable, and rule-based tasks with greater speed and accuracy than human workers. Consequently, occupations involving routine administrative, clerical, manufacturing, and customer service functions are particularly vulnerable to automation. As organizations seek to improve efficiency and reduce operational costs, certain traditional job roles may gradually decline or become obsolete. In India, where a substantial portion of the

workforce is employed in routine and low-skilled occupations, the risk of technological displacement is particularly significant.

- **Skill Mismatch and Workforce Adaptation:** Employers increasingly demand workers who possess digital literacy, analytical thinking, problem-solving abilities, and technological competencies. As a result, a gap may emerge between existing workforce capabilities and the skills required in an AI-enabled economy. This challenge is particularly relevant in developing economies such as India, where educational attainment and digital skills vary significantly across regions and socioeconomic groups.
- **Labor Market Polarization:** AI tends to complement highly skilled workers while substituting for routine tasks commonly performed by middle-skilled employees. This phenomenon may lead to an increase in demand for highly specialized professionals on one end of the labor market and low-skilled service occupations on the other, while reducing opportunities for middle-skilled workers. Such polarization can alter employment structures and create imbalances within the labor market.
- **Income Inequality and Wage Disparities:** Individuals with limited access to education, technology, and skill development programs may struggle to participate in the digital economy. The concentration of high-paying AI-related jobs among a relatively small segment of the workforce may widen wage gaps between skilled and unskilled workers. Furthermore, disparities may emerge between urban and rural regions, where access to digital infrastructure and technological resources often differs substantially. If these inequalities remain unaddressed, the benefits of AI may become concentrated among specific groups rather than being distributed broadly across society.
- **Challenges for the Informal Sector:** Unlike workers in formal sectors, informal employees frequently have fewer opportunities to acquire digital skills or participate in workforce development programs. Consequently, they may experience greater difficulties transitioning to new forms of employment created by technological advancement.
- **Ethical and Workplace Concerns:** AI systems often rely on large volumes of data for decision-making processes, including recruitment, performance evaluation, and workforce management. If not properly designed and monitored, these systems may reinforce existing biases or produce discriminatory outcomes.
- **Regional and Educational Disparities:** Differences in educational attainment, digital infrastructure, economic development, and technological readiness may create uneven outcomes among regions and population groups. Urban centers with strong technological ecosystems are more likely to benefit from AI-driven growth, whereas rural and

economically disadvantaged areas may face barriers to participation in the digital economy. Similarly, individuals with higher levels of education and technological expertise are generally better positioned to adapt to changing labor market demands.

8. Policy Implications and Recommendations

- **Strengthening Education and Skill Development:** Educational institutions should revise curricula to align with emerging industry needs and promote interdisciplinary learning that combines technical knowledge with critical thinking and communication skills. Continuous learning programs should be promoted through collaboration among government agencies, educational institutions, and private sector organizations. Special emphasis should be placed on providing accessible and affordable training opportunities for workers vulnerable to automation.
- **Promoting Lifelong Learning and Workforce Adaptability:** Policymakers should encourage lifelong learning through flexible training programs, online learning platforms, vocational education, and industry certification courses. Organizations should invest in employee training and create opportunities for workers to acquire new competencies that complement AI technologies.
- **Enhancing Digital Infrastructure and Accessibility:** Expanding high-speed internet connectivity, cloud computing facilities, and digital services is essential for enabling businesses, educational institutions, and individuals to participate in the digital economy. Reducing the digital divide is critical for ensuring inclusive development.
- **Supporting Employment Transition and Social Protection:** Policymakers should strengthen social protection mechanisms to support individuals affected by technological change. Measures such as unemployment assistance, career counseling, retraining programs, and employment placement services can facilitate smoother workforce transitions. Such interventions can reduce adjustment costs and improve labor market flexibility in response to technological advancements.
- **Encouraging Responsible and Ethical AI Development:** Governments and regulatory institutions should establish clear guidelines regarding transparency, accountability, fairness, and privacy in AI applications. Ethical frameworks can help ensure the individual rights and minimizes discriminatory outcomes. Organizations adopting AI should implement responsible governance practices, including regular monitoring of algorithms, protection of personal data, and mechanisms for addressing bias in automated decision-making processes.

- **Strengthening Public-Private Partnerships:** Public-private partnerships can facilitate knowledge sharing, workforce development, research activities, and innovation initiatives. Collaborative efforts can also support the development of AI research centers, innovation hubs, startup ecosystems, and entrepreneurship programs that contribute to economic growth and job creation.
- **Fostering Inclusive AI-Led Growth:** Special attention should be given to women, rural populations, informal sector workers, and economically disadvantaged groups who may face greater barriers to participation in the digital economy. Targeted training programs, digital inclusion initiatives, and financial support mechanisms can help expand access to AI-related opportunities.
- **Encouraging Research and Innovation:** Government support for research institutions, universities, startups, and technology enterprises can accelerate the development of indigenous AI solutions that address local economic and social challenges.

Conclusion

Artificial Intelligence (AI) is transforming the nature of work and redefining employment patterns across economies, including India. The study concludes that the future of employment in India will depend largely on the country's ability to prepare its workforce for technological transformation. Investments in education, reskilling, upskilling, digital infrastructure, and ethical AI governance are essential to ensure that the benefits of AI are widely shared across society. A balanced policy approach that promotes innovation while protecting workers from the adverse effects of automation can facilitate inclusive and sustainable development.

References

1. Autor, D. H. (2015). Why are there still so many jobs? The history and future of workplace automation. *Journal of Economic Perspectives*, 29(3), 3–30.
2. Brynjolfsson, E., & McAfee, A. (2014). *The second machine age: Work, progress, and prosperity in a time of brilliant technologies*. W. W. Norton & Company.
3. Filippi, E., Bannò, M., & Trento, S. (2023). Automation technologies and their impact on employment: A review, synthesis and future research agenda. *Technological Forecasting and Social Change*, 191, 122448.
4. Frey, C. B., & Osborne, M. A. (2017). The future of employment: How susceptible are jobs to computerisation? *Technological Forecasting and Social Change*, 114, 254–280.
5. Hötte, K., Somers, M., & Theodorakopoulos, A. (2023). Technology and jobs: A systematic literature review. *Technological Forecasting and Social Change*, 194, 122750.
6. International Labour Organization. (2023). *Generative AI and jobs: A global analysis of potential effects on job quantity and quality*. International Labour Office.

7. Lane, M., & Saint-Martin, A. (2021). *The impact of artificial intelligence on the labour market: What do we know so far?* OECD Social, Employment and Migration Working Papers No. 256. OECD Publishing.
8. Ministry of Electronics and Information Technology. (2018). *National strategy for artificial intelligence*. Government of India.
9. NASSCOM. (2022). *Artificial intelligence adoption index report 2022*. National Association of Software and Service Companies.
10. NASSCOM. (2026). *Strategic review of the Indian IT industry 2026*. National Association of Software and Service Companies.
11. NASSCOM, & Boston Consulting Group. (2024). *India's AI leap: BCG–NASSCOM report on artificial intelligence growth and adoption*. Boston Consulting Group and NASSCOM.
12. Organisation for Economic Co-operation and Development. (2023). *OECD employment outlook 2023: Artificial intelligence and the labour market*. OECD Publishing.
13. Schumpeter, J. A. (1942). *Capitalism, socialism and democracy*. Harper & Brothers.
14. Schwab, K. (2016). *The fourth industrial revolution*. World Economic Forum.
15. World Bank. (2019). *World development report 2019: The changing nature of work*. World Bank Publications.
16. World Economic Forum. (2023). *The future of jobs report 2023*. World Economic Forum.
17. World Economic Forum. (2025). *The future of jobs report 2025*. World Economic Forum.

PLAY-BASED AND PHILOSOPHICAL APPROACHES TO EARLY CHILDHOOD CURRICULUM

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Abstract

This chapter explores the major philosophical and curriculum approaches that have shaped early childhood education practice globally. Beginning with the foundational contributions of Maria Montessori, the chapter examines the distinctive features of Waldorf education, the Reggio Emilia approach, and three influential curriculum models: the Cognitively Oriented High/Scope Approach, the Direct Instruction Approach, and the Bank Street Approach (Developmental Interactionist Model). Each approach is analysed in terms of its theoretical foundations, key principles, classroom practices, the role of the teacher, and its strengths and limitations. The chapter emphasizes that understanding these diverse approaches enables educators to make informed decisions about curriculum design and pedagogical practice that best serve the needs of young children in their specific contexts.

Keywords: Montessori Method, Waldorf Education, Reggio Emilia Approach, High/Scope Curriculum, Direct Instruction, Bank Street Approach, Curriculum Models, Early Childhood Education.

Introduction

The content and composition of the preprimary programme including all daily activities, transitions, and routines that impact the child's physical, social, emotional, and intellectual development is called curriculum. A curriculum model refers to an educational system that combines theory with practice. It has a theory and knowledge base that reflects a philosophical orientation and is supported in varying degrees by child development research and educational evaluation.

The practical application of a curriculum model includes guidelines on how to:

- Set up the physical environment
- Structure activities and routines

- Interact with children and their families
- Support staff members through initial training and ongoing implementation

This chapter examines the major philosophical and curriculum approaches that have shaped early childhood education worldwide, from the pioneering work of Maria Montessori to contemporary models like Reggio Emilia and structured approaches like Direct Instruction.

The Montessori Method

Maria Montessori (1870–1952), Italy's first female physician, developed an educational approach that has made a tremendous impact on planning early childhood education programmes worldwide. Montessori advocated a system of education whereby a child should be provided with an environment that helps them grow at their own pace.

Major Views of Montessori

Principle	Explanation
Unfolding Potential	Development of a young child is essentially a process of unfolding the child's inherent potentialities to learn and acquire knowledge
Spontaneous Learning	Any attempt at educating should be based upon the child's desire to learn spontaneously
Scientific Observation	Montessori observed children carefully, determined experiences conducive to growth of individual interests, and prepared the classroom accordingly
Self-Activity	Self-activity by the child leads to better and more permanent learning. The adult should remain in the background
Teacher Role	The teacher's duty is to prepare the learning environment in an organized way with appropriate material and guide the child
Self-Corrective Materials	Materials should be self-corrective, allowing the child to get immediate feedback and progress independently
Sensory Training	The child acquires knowledge through senses; therefore training of the senses is essential
Didactic Apparatus	Specific materials and procedures allow intensive stimulation of senses in isolation
Practical Life	Exercises in practical life form an essential part of the preschool programme, helping the child become self-reliant and efficient
Academic Readiness	Activities for developing readiness for reading, writing, and number work provide a sound foundation for later schooling

The Montessori Classroom Environment

The Montessori classroom is a carefully prepared environment characterized by:

- **Order and accessibility:** Materials are arranged systematically on low, open shelves, each in its designated place
- **Child-sized furniture:** Everything is proportioned to the child's size to promote independence
- **Freedom of movement:** Children choose their activities and work at their own pace
- **Mixed-age groupings:** Typically three age groups together (e.g., 3–6 years), allowing younger children to learn from older ones and older children to reinforce learning by teaching

The Didactic Materials

Montessori materials are designed with specific characteristics:

- **Isolation of difficulty:** Each material teaches one concept or skill at a time
- **Control of error:** Materials are designed so children can see their own mistakes without teacher intervention
- **Attractiveness:** Materials are beautiful and inviting to children
- **Activity-focused:** Materials invite manipulation and exploration
- Examples include the Pink Tower (size discrimination), Sandpaper Letters (tactile introduction to writing), and Number Rods (quantity and length relationships).

Exercises in Practical Life

Practical life activities form the foundation of the Montessori classroom:

- **Care of self:** Dressing frames (buttoning, lacing, zipping), hand washing, food preparation
- **Care of environment:** Sweeping, dusting, flower arranging, table washing
- **Grace and courtesy:** Greeting others, saying please and thank you, interrupting politely
- **Control of movement:** Walking on the line, carrying a tray, pouring water

Real Life Example: The Three-Year-Old's Morning

In a Montessori classroom in Chennai, three-year-old Aanya arrives, hangs her bag on her hook, and chooses the pouring activity. She carefully pours beans from one small jug to another, spilling a few, and uses a small brush to sweep them into a dustpan. She repeats the activity four times, each time with greater precision. No adult has directed her; the prepared environment and self-correcting materials have guided her learning. After 25 minutes, she returns the tray to its shelf and chooses the knobbed cylinders, settling into deep concentration. The teacher observes from a distance, recording Aanya's choices and noting her lengthening attention span.

Waldorf Education

Developed by Rudolf Steiner in 1919, Waldorf Education is based on a profound understanding of human development that addresses the needs of the growing child. Waldorf teachers strive to transform education into an art that educates the **whole child** the heart and the hands, as well as the head.

Developmental Phases

The Waldorf curriculum is structured to respond to three developmental phases of childhood:

Phase	Age Range	Focus
Early Childhood	Birth to approximately 6–7 years	Learning through imitation and creative play
Middle Childhood	7 to 14 years	Learning through imagination and artistic presentation
Adolescence	14 to 18 years	Learning through independent thought and critical inquiry

Rudolf Steiner stressed that teachers must comprehend these phases fully and bring "age-appropriate" content that nourishes healthy growth.

Key Principles of Waldorf Education

Principle	Explanation
Education as Art	Education is an art; its goal is to bring life to children's experience with wonder and enthusiasm
Whole Child Education	To truly educate a child, the HEART and WILL must be reached as well as the MIND
Inspiration, Not Just Instruction	The intention is not merely to instruct, but to inspire and motivate each child's creative forces from within
Balanced Development	Lead the child to balanced development of clear thought, rich emotional life, and developed power of will
Developmental Appropriateness	Curriculum engages the abilities of the growing child at each developmental stage
Creative Play	In preschool, learning is accomplished through guided creative play
Imaginative Presentation	In elementary school, learning occurs through imaginative and artistic presentation of material
Independent Thought	In high school, learning challenges the student's awakening capacity for independent thought

The Role of Arts

Arts are an integral part of the Waldorf curriculum:

- **Painting and drawing:** Begins in kindergarten and continues through all grades
- **Sculpture:** Modeling with colored beeswax in kindergarten, clay in elementary school, stone and metal in high school
- **Music:** All children sing, play the recorder, learn to read music, and begin stringed instruments in third year
- **Drama:** Each grade presents a play that relates to its academic programme

Each art follows a developmental sequence from year to year, supplementing and reinforcing the main lesson curriculum. Artistic activity is woven into the entire fabric of each subject and used to teach all subjects.

The Class Teacher

One unique aspect of a Waldorf grade school is the class teacher:

- **Continuity:** The class teacher ideally remains with students from first through eighth grade
- **Trust:** This continuity facilitates a strong bond of trust between students, parents, and teacher
- **Integration:** The class teacher presents main academic subjects, coordinates with special subject teachers, and provides the link between home and school
- **Individualized knowledge:** Through intimate knowledge of the group, the teacher selects and emphasizes aspects of each discipline that best address the needs and interests of the class

Real Life Example: A Waldorf Kindergarten Morning

In a Waldorf kindergarten in Bengaluru, the room glows with soft pink light from silk curtains. Natural materials abound—wooden bowls, silk scarves, polished stones, and simple dolls with undefined features. Children engage in imaginative play: one group builds a house with wooden blocks and silk cloths; another "bakes" bread using play dough and acorns; a small child rocks a baby doll while humming.

The teacher sits quietly, darning a sock, occasionally offering a gentle suggestion or modeling an activity. There are no worksheets, no direct instruction in letters or numbers. At snack time, children sing a blessing, slice apples they helped wash, and pass a bowl of almonds. The morning unfolds in unhurried rhythms, honoring Steiner's belief that young children learn through imitation and wonder, not intellectual instruction.

The Reggio Emilia Approach

The Reggio Emilia approach is an educational philosophy and pedagogy that originated in the town of Reggio Emilia, Italy, after World War Two. A group of parents and educators came together to create a new educational system that would foster children's intellectual, emotional, and social development, inspired by the philosophies of Lev Vygotsky and John Dewey.

The Image of the Child

The approach is centered around a three-pronged image of the child:

Dimension	Description
Capable and Autonomous	The child is considered to be a capable and autonomous actor
Innately Curious	Children are believed to be innately curious about the world
Active Learner	Children are seen as active learners rather than passive receptors of knowledge

Key Principles

Principle	Explanation
Project-Based Learning	Emphasis on hands-on, project-based learning where children explore, question, and construct knowledge
Environment as Third Teacher	The physical environment is intentionally designed to provoke discovery and communication
Hundred Languages of Children	Children express themselves through multiple symbolic languages (drawing, sculpture, dramatic play, writing, etc.)
Documentation	Teachers document children's work and words to make learning visible and inform planning
Collaboration	Learning is social; children work in small groups, discussing and negotiating meaning
Emergent Curriculum	Curriculum arises from children's interests rather than being predetermined
Teacher as Researcher	Teachers observe, listen, and research alongside children

The Hundred Languages of Children

A central metaphor in Reggio Emilia is the "hundred languages of children" the idea that children have many ways of expressing themselves and understanding the world. These languages include:

- Drawing and painting
- Sculpture and construction

- Dramatic play
- Music and dance
- Writing and storytelling
- Conversation and discussion

The teacher's role is to provide materials, time, and supportive contexts for children to explore these multiple languages.

Real Life Example: The Amusement Park for Birds Project

One of the most famous Reggio Emilia projects involved children designing and building an amusement park for birds. Over several months, children:

- Observed birds in the school courtyard
- Drew and painted birds
- Discussed what birds might enjoy
- Built prototypes of swings, slides, and perches
- Negotiated design decisions in small groups
- Constructed the final structure

Throughout the project, teachers documented children's conversations, sketches, and constructions, making learning visible through photographs and transcribed dialogue displayed on classroom walls. The project integrated science, art, mathematics, language, and social studies—not as separate subjects but as interconnected ways of understanding.

Curriculum Models

The Cognitively Oriented High/Scope Approach

This approach, based on the cognitive development theory of Jean Piaget, was developed under the leadership of David Weikart during the 1960s. It was initially designed for preschool children from impoverished backgrounds. The basic premise is that children are active learners constructing knowledge through meaningful experiences.

Key Experiences in Eight Concept Areas

Concept Area	Description
Active Learning	Employs all senses; allows child to select activities and materials
Using Language	Through talking, writing ideas, and playing with language
Representing Experiences and Ideas	Through art, writing, role playing, and use of senses
Classification	Using materials to group and classify

Seriation	Developing ability to order, compare, and match objects
Number Concepts	Foundation for mathematical understanding through counting, adding, subtracting
Spatial Relationships	Puzzles, exploring environment with bodies, describing location and distance
Time Concepts	Understanding units of time (hour, day, month, year) and sequence

The Plan-Do-Review Sequence

A distinctive feature of High/Scope is the plan-do-review sequence:

- **Plan:** Children plan their activities (what they will do, where, with what materials, with whom)
- **Do:** Children carry out their plans, working and playing
- **Review:** Children recall and represent their experiences

Role of the Teacher

The teacher's role is critical. Teachers must master the art of questioning so children's thinking is extended. They observe, support problem-solving, and help children reflect on their experiences.

The Direct Instruction Approach

Developed by Bereiter and Engelmann during early Head Start programming, this approach aimed to help children from low socioeconomic backgrounds gain skills needed for elementary school success.

Theoretical Foundation

This approach is based on behavioural principles of cause and effect, stimulus and response, and behavior modification. Behaviourist educational approaches focus on teacher-directed activities with carefully planned lessons, drills, and exercises for practicing important concepts.

Key Features

Feature	Description
Academic Focus	Lessons in three areas: language, reading, and mathematics
Precise Scripting	Teacher's questions require specific student responses
Constant Reinforcement	Positive words of praise and tangible rewards motivate participation
Rewards	Prizes, special privileges, certificates
Pacing	Fast-paced, carefully sequenced lessons
Small Groups	Homogeneous grouping for targeted instruction

Criticisms

Critics point out that over-reliance on external reinforcement diminishes children's internal or intrinsic motivation. The satisfaction of successful task completion is considered the optimal type of reinforcement, which may be undermined by excessive external rewards.

Real Life Example: Direct Instruction Lesson

A Direct Instruction reading lesson with four kindergarteners:

Teacher holds up a card with "mat." "This word is 'mat.' Say it with me: mat."

Children: "Mat."

Teacher: "Good. What sound does 'm' make? Everyone: /m/."

Children: "/m/."

Teacher: "Excellent. Now watch: mmm-aaaa-t. Blend it with me."

Children: "mmmaaat."

Teacher: "What word?"

Children: "Mat!"

Teacher: "Great job! Here's a sticker for everyone who blended so well."

The lesson continues with rapid-fire questions, choral responses, and individual turns, all within a 15-minute session.

The Bank Street Approach/Developmental Interactionist Model

The Bank Street Approach (1930) takes its name from the Bank Street College of Education in New York City. It is grounded in the philosophy of John Dewey and other progressive educators, influenced by Freud's theoretical claims about the profound formative influence of early childhood years.

Goals of the Bank Street Approach

Goal	Description
Promoting Autonomy and Exploration	Encouraging children to make choices and investigate their environment
Developing Positive Learner Self-Concept	Building competence and confidence through meaningful experiences
Developing Communication and Self-Expression	Supporting children in expressing thoughts and feelings
Establishing Impulse Control	Helping children develop self-regulation

Core Principles

- **Meaningfulness:** Emphasis on meaningfulness, continuity, and depth of knowledge rather than achievement of specific academic objectives

- **Developmental-Interactionist:** Concerned with interaction of all areas of a child's development (cognitive, social, emotional, physical)
- **Environment-Child Interaction:** Places emphasis on interaction between environment and child's development
- **Experiential Foundation:** The child's environment and experiences are considered the foundation of curriculum

Classroom Environment

The classroom is arranged into conventional interest areas like Music, Art, Reading, Science, Mathematics, Dramatic play

Teacher-made and child-made materials are considered most suitable for the unique needs of children in individual classrooms.

Role of the Teacher

The Bank Street Approach relies on competent teachers who are:

- Knowledgeable in child development principles
- Able to interpret individual needs of children through observation
- Skilled in creating meaningful learning experiences
- Responsive to children's interests and questions

Criticisms and Research

The negative criticism is that this approach emphasizes long-term goals rather than specific short-term objectives. However, research studies have revealed that children's cognitive gains and motivation to learn are enhanced over the long term through this approach.

Real Life Example: Bank Street Classroom

In a Bank Street classroom, four-year-olds have been fascinated by a construction site visible from their window. The teacher builds on this interest through an extended project:

- Children visit the site (with permission and safety gear)
- They photograph the workers and machines
- Back in class, they draw what they saw
- They dictate stories about construction
- They build their own construction site in the block area
- The teacher reads books about building
- Children create signs for their construction zone

Throughout, the teacher observes, documents, and extends children's thinking through thoughtful questions. There is no predetermined timeline or set of objectives; learning emerges from children's authentic engagement with meaningful content.

Comparative Summary of Curriculum Approaches

Aspect	Montessori	Waldorf	Reggio Emilia	High/Scope	Direct Instruction	Bank Street
Theoretical Basis	Unfolding potential, sensory training	Anthroposophy, developmental phases	Constructivism, Vygotsky, Dewey	Piaget's cognitive development	Behaviourism	Dewey, Freud, progressive education
Image of Child	Unfolding potential	Growing through developmental stages	Capable, curious, active	Active learner constructing knowledge	Receptive learner needing instruction	Active explorer in social context
Teacher Role	Guide, preparer of environment	Artist, model, class teacher	Co-learner, researcher, documenter	Facilitator, questioner	Director, instructor	Observer, responsive planner
Curriculum Source	Didactic materials, practical life	Developmental stages, arts	Children's interests, projects	Key experiences, child plans	Prescribed academic sequence	Children's experiences, environment
Role of Play	Self-chosen work with materials	Imaginative, creative play central	Hundred languages, project work	Plan-do-review, active learning	Limited; focus on instruction	Exploration, discovery central
Arts Integration	Limited; sensory materials	Central to all learning	Hundred languages, expression	Representing experiences	Minimal	Integrated through interest areas
Strengths	Independence, self-discipline, concentration	Whole child, imagination, rhythm	Creativity, collaboration, documentation	Active learning, planning skills	Academic gains, clear structure	Meaningful learning, depth, motivation
Limitations	Limited imaginative play, creativity	Can be rigid, minimal academics	Requires skilled teachers, documentation time	Requires teacher skill in questioning	Diminishes intrinsic motivation	Long-term goals, difficult to measure

Choosing Among Approaches

No single approach is universally "best." Educators must consider:

Factor	Questions to Ask
Child Population	What are the needs, backgrounds, and strengths of the children?
Family Expectations	What do families value and expect from the programme?
Community Context	What is valued in the local community and culture?
Teacher Expertise	What training and support do teachers have?
Resources	What materials, space, and time are available?
Philosophical Alignment	Does the approach align with the programme's mission and values?

Many contemporary programmes draw from multiple approaches, creating an eclectic or integrated curriculum that combines strengths of different models.

References

1. Bank Street College of Education. (2023). *Developmental-interactionist approach*. Bank Street College Publications.
2. Edwards, C., Gandini, L., & Forman, G. (Eds.). (2012). *The hundred languages of children: The Reggio Emilia experience in transformation* (3rd ed.). Praeger.
3. Engelmann, S., & Bereiter, C. (1966). *Teaching disadvantaged children in the preschool*. Prentice-Hall.
4. Gardner, H. (1999). **The disciplined mind: Beyond facts and standardized tests, the K-12 education that every child deserves**. Simon & Schuster.
5. Lillard, A. S. (2017). *Montessori: The science behind the genius* (3rd ed.). Oxford University Press.
6. Montessori, M. (1912). *The Montessori method*. Frederick A. Stokes Company.
7. Nicol, J., & Taplin, J. T. (2018). *Understanding the Steiner Waldorf approach: Early years education in practice* (2nd ed.). Routledge.
8. Schweinhart, L. J., Montie, J., Xiang, Z., Barnett, W. S., Belfield, C. R., & Nores, M. (2005). **Lifetime effects: The High/Scope Perry Preschool study through age 40**. High/Scope Press.
9. Steiner, R. (1996). *The education of the child and early lectures on education*. Anthroposophic Press.
10. Weikart, D. P., & Schweinhart, L. J. (1997). *High/Scope Perry Preschool program*. In G. W. Albee & T. P. Gullotta (Eds.), *Primary prevention works* (pp. 147–166). Sage Publications.

CONVERGENCE OF INFLUENCER MARKETING AND GENERATION Z

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Abstract

The growth of social media platform has tremendously influenced the retail sector, creating new pathways through which consumers discover, evaluate, and purchase products. Most influential developments are influencer marketing—a model in which social media influencers act as trusted intermediaries between brands and consumers. This phenomenon has gained particular significance among Generation Z (Gen Z), whose purchasing behaviours are directly shaped by S digital experiences. Gen Z heavenly relies upon on influencer marketing to fulfil their needs & wants regarding product and services, influencer advice, suggestion, opinions matter most for them. This chapter examines the evolution of influencer marketing, the psychological mechanisms that drive influencer effectiveness, and the opportunities and challenges faced by brands in present scenario and concludes with future insight for influencer marketing.

Keywords: Influencer, Generation, Significance, Suggestion, Scenario.

1. Introduction

With the digitization of modern economy retailing sector also witnessed impressive changes. Traditional advertising media e.g television, newspapers, radio, posters, billboards have gradually lost their momentum as growth of social media platforms that helps in speedy disbursement of information of brands & assist in making purchase decisions. Social media platforms such as Instagram, Facebook, TikTok, YouTube, Snapchat, has enabled individuals with substantial online fan followings to become influencer. Influencer marketing refers to the practice where social media influencers act to promote, recommend, and sell products and services of particular brands by using his supremacy and with direct engagement with their followers. Generation Z (also known as zoomers) refer to individuals born between 1997 and 2012, who are tech savvy. These consumers have grown up with smartphones, social networking platforms, and constant internet connectivity. Their purchasing decisions are increasingly shaped by their influencers who provide product recommendations, lifestyle inspiration. The interaction of influencer marketing and Gen Z has created a new web were community, commerce, content blend with each other's.

2. Characteristics of Gen Z

In terms of technical knowledge, technology adoption & advancement, communication patterns, life style & consumption behaviour Gen Z is totally different from their old once. This generation has following characteristics:

- Tech savvy lifestyle
- Browse online stores
- High engaged in social media
- Preference for visual content
- Demand for authenticity and transparency
- Short attention spans but high information-processing capability
- Desire for personalized & excellent experiences
- Lives in digitally connected world

3. Purchasing Behaviour of Gen Z

Gen Z consumers reflect unique purchasing patterns, which is categorised into following phases:

- **Research-Oriented Buying:** Before making purchases, Gen Z done exclusive research products on internet and rely on social media reviews, Influencer recommendations & opinion, online ratings and testimonials given by influencer.
- **Experience-Based Consumption:** Gen Z evaluate products not only on function, features basis but also on the experiences of others consumers.
- **Value-Based Consumption:** Gen Z go for the favour of brands that demonstrate sustainability, diversity, ethical business practices and social responsibility.

4. Evolution of Influencer Marketing

Influencer marketing has evolved through several stages:

Stage 1: Celebrity Endorsements

In old times brands basically were relied on movie stars, athletes, and public figures, celebrities to promote & advertised products, because of having strong impression on consumer minds

Stage 2: Blogging and Content Creators

With internet growth Some independent bloggers and content creators gained credibility within specific communities, but their reach & influences was limited due to non availability of smartphones and other tech gadgets.

Stage 3: Social Media Influencers

Social media platforms such as Instagram, Facebook and YouTube gained popularity which helps ordinary individuals to build large audiences.

Stage 4: Influencer marketing

At present Influencers participate directly in retail processes via multiple options

- Affiliate marketing
- Product collaborations
- Brand ownership
- Live-stream shopping

This last stage totally changes the market horizon due to wide acceptance by Gen Z. It compels the brands to reshape & redesign their strategies of promotion and adopt innovation in products, services to keep ahead in market.

5. Types of Influencers

Influencers are commonly categorized into four parts on the basis of their followers count

Type	Numbers of Followers
Nano Influencers	1,000-10,000
Micro Influencers	10,000-1,00,000
Macro Influencers	1,00,000- 1 million
Mega Influencers	Over 1 million

6. Social Commerce and Influencer marketing

The Emergence of Social Commerce

Social commerce blends shopping activities directly into social media platforms. Where consumers can discover new arrival products, read reviews and opinions of others, watch live demonstrations and make purchases online at their comfort.

Influencer-Led Shopping Experiences

Influencers facilitate purchasing of Gen Z through various modes such as

- **Live Streaming:** It refers to real-time demonstrations of product working with large number of consumers and also share their reviews about product functions, durability, reliability etc.
- **Affiliate Links:** It is a strategy to increase sale of particular brand product where influencer out product buying link on his social media platform, when target consumer view and buy product from given link then influencer get commission based on sale value.
- **Platform-Specific Retailing:** various platform such as Instagram, TikTok, YouTube, snapchat provide option to tag product makes reels influencer collaborations with brands and post interactive advertisements.

7. Benefits of Influencer marketing for Brands

- **Enhanced Consumer Trust:** Now a days Gen Z consumers trust more on influencers rather than conventional advertisements because of more authentic content.
- **Increased Engagement:** Influencer marketing engage more consumers in product publicity in form comments, live chats, shares, likes, community discussions. These types of interactions enhance strong bonds between brand.
- **Improved Targeting:** Influencer marketing helps brands in approaching & targeting specific audience segments in a market. For examples various campaigns or contents are designed to attract beauty enthusiasts, gamers community, fitness & gym lover communities and fashion-conscious consumers.
- **Higher Conversion Rates:** Influencer content are so impressive and highly engaged that it can easily convince their followers, so that most of target audience make their mind to purchase. It converts random visitors into permanent customer.

8. Challenges and Ethical Concerns face by Influencer marketing

- **Authenticity Issues:** As today influencer marketing becomes more commercialized. They put reels and post to just earn their revenue so it creates doubt in followers' minds whether recommendations are genuine or financially motivated.
- **Fake Followers and Engagement Fraud:** another serious concerns that some influencers artificially inflate their popularity with the help of purchased & dummy followers, automated likes, comments from their knowns or friends. All above undermine validity & effectiveness of particulars campaign.
- **Disclosure and Transparency:** Another hurdle is on the part of transparency where regulatory authorities require influencers to clearly disclose sponsored content. But in the absence of this mislead innocent consumers, damage brand credibility & image and sometimes create legal risks.
- **Mental Health Concerns:** Influencer marketing present a ideal lifestyles which may not be happen possible always. Constant exposures to idealizes life styles may sometimes contribute to mental anxiety, feels low self-esteem, always make social comparisons and keeps materialistic attitude.
- **Privacy Concerns:** Influencer marketing is mainly rely upon data collection of target consumers. Sometimes it creates hurdles when their personal & sensitive data is misused or used without their consent.

9. Influencer Marketing Across Industries

- **Beauty & Cosmetic Industry:** Beauty brands widely used female influencers to demonstrate products, provide tutorials video, generate product reviews. This strategy allows consumers to evaluates products before buying & transformed product launches into highly interactive social events.
- **Fashion Retail:** It is the one of the biggest sectors covered by influencer marketing where consumer brand perception, style preference & seasonal trends are highly affected via effective content, outfit recommendations, dress styling sense.
- **Fitness and Wellness:** This type basically covers audience who are health conscious & fitness lovers. Influencers try to promote diet supplements, fitness & exercise equipment's, apparel, online coaching programs.
- **Food Products:** Another major area covered by influencer Food sectors where recipe demonstrations, restaurant reviews, drink recommendations and experiential storytelling are provided.

10. Future Trends in Influencer marketing

AI-Driven Influencer marketing

With the emergence of AI technology now a days virtual influencers act as a new retail ambassador. These influencers impact is so powerful that can easily convince and manipulate Gen Z. Their presentation, opinion, suggestion, review matter more than conventional marketing media.

Live Commerce Expansion

Live shopping events are expected to become increasingly mainstream, blending entertainment and retail experiences.

Augmented Reality Shopping

AR technologies will enable consumers to virtually try products before the actual purchase. It is mainly implied in case of clothing, cosmetic product range.

Creator-Owned Brands

Today some strong influencers are moving one step beyond. Instead of brand endorsements, they are coming up with their own brands, strengthening direct relationships with consumers.

Data-Driven Personalization

Latest analytics technology allows brand to gather and analysis data about Gen Z preferences, needs and desire so as to deliver personalised services that are best suited to their requirement.

11. Strategic Recommendations for Retailers

To capture & sustain Gen Z consumers through influencer marketing, retailers should:

- Check authenticity and uniqueness of follower count.
- Should collaborate with micro influencers.
- Encourage to develop user friendly content.
- Maintain transparency.
- Take into considerations social and environmental ethical issues.
- Utilize data analytics to measure campaign effectiveness.
- Develop long-term influencer relationships rather than one-time partnerships.

Conclusion

In modern competitive environment day by day new innovations are taking place and influencer marketing is not an exception. The blend of social media & retailing has totally changed the scenario in the market to advertised and sale the product. Generation Z, consumers heavily relying upon influencer marketing for their shopping behaviours as they consider it authentic, personalised and reliable in digital environment. Influencer marketing unlock seamless opportunities for brands to make connections with consumers and to increase its sales. But at the same time care should be to taken about the authenticity, transparency, ethical aspects. Those brand who are able to align these concerns with influencer marketing are in position to win the loyal Gen Z consumers in long run. In modern digital world influencer marketing is a not one option rather it is a essential tool in hand of brands to lead in cut throat competition. But blindly dependence on influencer marketing can cause serious harmful consequences so before as well as after collaboration with influencers strict vigilance is required about content, followers reviews, transparency, consumer engagement & conversion rate, campaign effectiveness.

References

1. Ali, M., & Khan, S. (2025). The role of influencer marketing on Gen Z's consumer brand perception: A case of Instagram's effectiveness in Peshawar. *Journal of Business and Social Review*, 4(2), 115–130.
2. Kumar, A., & Patel, R. (2026). Exploring the impact of social media influencer marketing on Gen Z consumer engagement. *International Journal of Digital Marketing*, 7(1), 45–62.
3. Kumar, H. (2026). A study on the impact of influencer marketing on buying decision of Gen Z. *Indian Journal of Modern Research and Reviews*, 4(2), 188–191.

4. Kurniawan, D., & Wijaya, A. (2025). Social media lifestyle and its influence on Gen-Z buying behavior: The intersection of emotional drive and financial trends. *Global Journal of Consumer Psychology*, 8(3), 204–218.
5. Malik, R., & Sharma, V. (2026). Impact of Gen Z purchasing via influencer credibility: Evaluating the surge and response to de-influencing trends. *International Journal of Innovative Science and Research Technology*, 11(2), 1412–1425.
6. Santos, M. D., & Taylor, R. (2025). The impact of influencer marketing on Gen Z's purchase decisions: A comparative study across social media platforms. *International Scientific Journal of Engineering and Management*, 4(3), 89–104.
7. Sharma, P., & Gupta, A. (2026). Impact of social media influencer trust and engagement on Generation Z purchase behaviour and long-term brand loyalty. *International Journal of Business and Economics Research*, 12(9), 117–132.

**“LAAPATAA LADIES” AND BEYOND THE VEIL:
INSIGHTS INTO WOMEN’S STRUGGLES THROUGH LENS AND LAWS**

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Abstract

This article emphasizes on the thought-provoking movie “*Laapataa Ladies*” (Lost Ladies), directed by Kiran Rao, which humorously captures the struggles faced by women due to societal norms and patriarchal constructs. Through the lens of societal reflections, the movie navigates through the lives of two brides entangled in confusion, shedding light on issues like women's right to identity, freedom, and violence against women. The movie serves as a compelling portrayal of the pervasive nature of gender-based restrictions and the ongoing struggle for gender equality. It reflects on the journey of social reform in India, marked by the tireless efforts of visionaries and social reformers like Raja Ram Mohan Roy and Mahatma Gandhi. The movie urges audiences to challenge patriarchal norms, advocating for the removal of the 'veil' that suppresses women's rights and identity. The author discusses legislative frameworks and judicial activism which strengthened women's rights.

Keywords: *Laapataa Ladies*, Gender Rights, Dowry Prohibition, Violence Against Women, Women’s Rights, Judicial Activism, Policy for Women.

Introduction

The movie, “*Laapataa Ladies*” (Lost Ladies), directed by Kiran Rao, and also produced by her along with Aamir Khan and Jyoti Deshpande, hilariously captures a sequence of events involving confusion, stigmas and societal reflections. It traces the journeys of two entirely different brides and their responses to the circumstances they find themselves in. While the movie is primarily about the mix-up between two brides in identical red veils, “*Laapataa Ladies*” could well mean the women we lose each year to the repressive ideals of morality, virtue and honor that develop organically within a society controlled by patriarchal norms. Repressive ideals that are symbolized in the movie by the *ghoonghat* (veil) which erases the individuality of the woman behind it. The veil symbolizes a patriarchal culture that restricts women's freedom and suppresses their rights. Three important issues concerning women are discussed in the movie: 1) Women’s Right to Identity, 2) Women’s right to freedom, and 3) Violence against women. The original tale by Biplab Goswami, along with the script and language by Sneha Desai, explores

suppression of women in a humorous and satirical manner. Women still lack the right to mention their husband's name, can't cook what they like, can't make their own decisions, and often have to sacrifice their talents for the sake of family. This article tries to navigate through rights of women and issues of gender rights, as shown in the movie, primarily through the viewpoints of societal norms, patriarchal concepts, and right to identity. It reflects on how these issues manifest in various aspects of women's lives, such as identity, freedom, and expectations from society.

Women's Right to Identity

The movie adeptly highlights the symbolism of the veil as a potent representation of patriarchal cultures, acting as a force that gradually erodes women's individuality and identity. By employing the veil as a metaphor for societal norms and expectations, the movie poignantly reflects how women's identities become submerged within traditional gender roles. This is illustrated through the idea of "*Laapataa Ladies*", which further amplifies the erasure of women's identities within patriarchal cultures. Consequently, the discourse surrounding the veil and its implications acts as a compelling call to action, supporting the assertion and reclamation of women's identity rights, autonomy, and self-expression.

In the narrative, the characters of Phool and Jaya exemplify the battles and triumphs against these entrenched norms. Phool initially hesitates to take her husband's name, Deepak, embodying the societal pressure and internalized oppression that prevent her from asserting her identity. Conversely, Jaya defies this stereotype, shocking those around her by boldly taking the name of her imaginary husband. This scene demonstrates a hilarious situation through which a powerful message is conveyed against societal expectations, challenging the notion that a woman's identity must be defined by her marital status.

The scene where Phool's name is registered in the lost and found by the station master encapsulates both humour and irony. It highlights the absurdity of a woman being identified solely through her marital connection, while also exposing the entrenched nature of patriarchal dominance. Phool's journey throughout the movie reflects the phases of growth experienced by the female characters. Initially, she resists revealing her husband's name to the station master, symbolizing her insistence on adhering to societal norms. However, as the narrative progresses, Phool undergoes a transformation, culminating in a pivotal moment where she confidently calls out her husband's name. Manju Mai, who acts as Phool's guide, is another personification of this path of self-exploration and empowerment. Manju Mai, who has personally suffered domestic abuse, highlights the importance of a woman's name as a crucial component of her identity. She exhorts Phool to reveal her husband's identity in order to accept her freedom and exercise her

right to self-expression. Manju Mai intriguingly counselled Phool on the empowerment and liberation of women. It is reflected from this dialogue of Manju Mai (as translated in verbatim) - *'Women have the ability to cultivate crops and prepare meals, as well as to give birth to and nurture children. When considering these capabilities, one might argue that women could manage quite well without men. However, if women were to fully realize this independence, men would find themselves in a difficult situation, wouldn't they?'*

This interaction marks a crucial turning point in Phool's journey, as she begins to identify the value of reclaiming her identity and asserting her agency. The closing sequence, in which she cries out Phool's name and Deepak eventually finds him, masterfully conveys the importance of names and identities. It represents Phool's newly gained self-confidence and empowerment as she reunites with her husband and boldly declares who she is. This event not only gives a happy ending of Phool and Deepak's journey, but also serves as a powerful reminder of the value of a person's individuality and ability to express themselves in the face of patriarchal oppression.

Women's Right to Freedom

The movie explores in depth the various way that gender roles and cultural expectations shape women's choices and behaviours, as well as the widespread restrictions placed on women's independence in patriarchal societies. It portrays characters like Jaya, Phool, Deepak, Deepak's family members, Manohar (police officer) and other officers in police station, Deepak's friends, politician, etc. in a way that effectively highlights the complexity of these limitations and how they affect the lives of women. The movie subtly tackles the issue of gender rights by criticizing patriarchal systems that uphold discrimination and injustice against women. Through its examination of societal norms and practices, it highlights the imbalance of power and privilege that exists between men and women within patriarchal cultures. The movie highlights the oppression and marginalisation that women face, highlighting the necessity for gender-sensitive strategies to overcome structural injustices and advance gender rights and equality.

The restrictions placed on women's independence by social and familial systems is one of the main topics of the movie. It implies that women's lives are governed by patriarchal standards in a number of ways, from their power to voice their desires to make independent decisions. The fact that women are unable to speak about their husbands by name, prepare meals in accordance with their tastes, or stand up for their own rights highlights how ubiquitous these limitations are in patriarchal cultures. The part where Deepak's mother categorically says that women in the family cannot prepare what they like to eat is a perfect example of this issue. This brief yet emotional moment captures the inflexible gender norms and expectations that direct women's actions and decisions in the home. It highlights various manners whereby women are confined to

conventional roles and denied autonomy over even the most fundamental elements of their life, such as food preferences.

Violence against Women

The movie enumerates various issues of women's rights, including domestic violence, dowry, and women's right to education. By highlighting these issues, it displays how widespread violence and prejudice against women are in our culture. The consideration of themes such as women's safety, filing complaints, and harassment further emphasizes the systemic barriers that women face in accessing their rights and seeking justice. Additionally, the movie suggests that women continue to encounter suppression and inequality, as evidenced by their limited rights and societal expectations placed upon them.

The movie meticulously examines various women's rights issues, shining a light on the pervasive gender-based discrimination and violence deeply ingrained in society. It meticulously outlines concerns such as domestic violence, dowry, and women's access to education, effectively highlighting the systemic obstacles hindering women's pursuit of justice and equality. Moreover, it poignantly portrays the harsh realities women face, illustrating how societal norms perpetuate suppression and inequality. One central theme explored is dowry, exemplified by Jaya's family's struggle. Compelled to sell their land to meet dowry demands, they fall victim to a system that commodifies women and imposes financial burdens on families. This portrayal is a clear reminder of the unfairness and economic exploitation that are part of dowry rituals. During Deepak and Phool's train journey to his village, casual inquiries about dowry from fellow passengers underscore the normalized nature of this practice. The belief that social status or occupation determines dowry amounts further highlights entrenched gender-based discrimination and inequality.

Additionally, the movie addresses domestic violence through Jaya's husband, Pradeep. Accusations of abuse, including allegations of murder, reveal the grim reality faced by many women. This portrayal condemns patriarchal attitudes that perpetuate violence and oppression within relationships. The revelation of charges of domestic abuse against Pradeep, coupled with the accusation of murdering his first wife due to her inability to conceive, adds a layer of complexity to the narrative. It emphasises how common gender-based violence is in intimate relationships and how harmful patriarchal expectations about marriage and fertility may be. This portrayal not only highlights the individual suffering endured by women like Pradeep's first wife but also serves as a sobering reminder of the broader societal attitudes that support violence and control over women's bodies. Furthermore, it deepens the thematic study of women's rights and the pressing need for societal change to address systemic inequalities and ensure the safety and

autonomy of all individuals, regardless of gender. Furthermore, the movie confronts barriers to women's safety and justice, illustrating resistance and indifference when filing complaints or seeking redress for harassment. This portrayal exposes systemic failures in legal and societal institutions tasked with safeguarding women's rights, exacerbating their vulnerability to abuse. Moreover, one thing is need to be considered that how Deepak, Manohar, and Deepak's friends, more than a man, being a human, played a crucial role in upholding rights of women by playing active role in allowing Jaya to pursue her studies and protesting against the atrocities of Pradeep.

Protection of Women: Role of Men

It is essential to consider how Deepak, Manohar, and their friends, not just as men but as individuals, played a crucial role in upholding women's rights. They actively supported Jaya in pursuing her studies and protested against the atrocities committed by Pradeep. It is essential to acknowledge the broader societal context in which this narrative unfolds. In many traditional societies, women's rights and autonomy have been marginalized, with societal norms often dictating their roles and opportunities. However, within this framework, the actions of Deepak, Manohar, and their friends stand out as pivotal moments of defiance and support for women's empowerment. Deepak, Manohar, and their friends, portrayed as more than just men but as individuals recognizing their humanity, play crucial roles in challenging the status quo. Instead of conforming to patriarchal expectations or remaining passive bystanders, they actively support Jaya's pursuit of education. This is a significant departure from traditional gender roles, where men are often seen as the primary decision-makers and women's aspirations are subordinated. By supporting Jaya's education, Deepak, Manohar, and their friends demonstrate a commitment to recognition of women's right. They reject the notion that women should be confined to traditional roles and instead advocate for their empowerment through access to education. This aligns with the larger worldwide campaign towards gender equality and women's empowerment, where education is recognized as a fundamental tool for social and economic advancement.

Furthermore, their proactive stance extends beyond mere support for education. They also take a stand against the injustices perpetrated by Pradeep, signalling their refusal to tolerate violence or discrimination against women. This activism is crucial in challenging societal attitudes and norms that condone or perpetuate gender-based violence. By speaking out against Pradeep's actions, Manohar, sends a powerful message that violence against women will not be tolerated and that perpetrators will be held accountable for their actions. In essence, the actions of Deepak, Manohar, and their friends represent a broader movement towards gender equality and women's empowerment. Through their support for Jaya's education and their condemnation of Pradeep's atrocities, they challenge traditional gender roles and patriarchal norms. Their actions serve as a

reminder that gender equality is not just a women's issue but requires the active participation and support of men as well. By recognizing the humanity and rights of women, they contribute to a more inclusive and equitable society for all.

Upliftment of Women: Reformers in India

Raja Ram Mohan Roy, Ishwar Chandra Vidyasagar, Dayanand Saraswati, Begum Rokeya, Swami Vivekananda, and Mahatma Gandhi, were among the influential figures who shaped social reforms in 19th-century India (Singh and Dhar 2023). They all made distinct contributions to the progress of society, especially in relation to caste discrimination, women's rights, widow remarriage, and education. The "Father of the Indian Renaissance," Raja Ram Mohan Roy, played a key role in eradicating Sati and advancing education. Prominent scholar and social reformer Ishwar Chandra Vidyasagar supported a number of issues, including the encouragement of women's education and widow remarriage. Through his efforts, the Widow Remarriage Act was passed in 1856. Dayanand Saraswati, the Arya Samaj's founder, fought for women's rights and the rights of underrepresented groups while advancing social and religious reforms. Renowned for spearheading India's independence fight, Mahatma Gandhi also placed a strong emphasis on social changes, such as women's emancipation and the elimination of untouchability. Many people were motivated to act for social justice and the benefit of society at large by Swami Vivekananda's teachings. In India, Maharshi Karve and Savitribai Phule were among the first to advocate for women's education and empowerment. Among the pioneering feminists in India who battled against gender inequality and for women's rights were Begum Rokeya and Rani Rashmoni (Singh and Dhar 2023). These people's efforts were vital in questioning social conventions and promoting a society that is more inclusive and egalitarian. Their efforts set the stage for several laws and social reforms that came after, ultimately advancing the status quo and empowering women and underprivileged groups in India.

Rights of Women: Legislative Protection

India has taken significant legal measures to combat the social evil of dowry and related issues. The laws are enacted to prevent the exchange of dowry, protecting women from domestic violence, and ensuring accountability for those involved in such practices. The Dowry Prohibition Act, with its stringent penalties for both demanding and giving dowry, is a crucial step towards eradicating this harmful tradition. Additionally, the requirement for couples to maintain a list of gifts exchanged during marriage ceremonies adds transparency and accountability to the process. Inserted in 1983, Sections 498-A of the Indian Penal Code, 1860, Section 174(3) and 198-A of the Criminal Procedure Code, 1973, and Section 113-A of the Indian Evidence Act, 1872, address instances of cruelty towards wives and inquiry in death of a

woman due to cruelty or dowry demands. Additionally, Section 304B was inserted in 1986 recognizing the offence of dowry death. These sections provide legal recourse for women who face harassment or violence due to dowry demands, holding perpetrators accountable for their actions. Furthermore, the enactment of the Domestic Violence Act in 2005 further strengthens legal protections for women experiencing abuse within their homes. This comprehensive legislation acknowledges various forms of domestic violence and provides avenues for victims to seek protection and support. Overall, these laws reflect India's commitment to safeguarding the rights and dignity of women, and they play a crucial role in combating gender-based violence and discrimination. Some of the important Acts protecting the rights of Women are mentioned below (Singh and Dhar 2023):

- The Hindu Marriage Validity Act, 1949.
- The Special Marriage Act, 1954.
- The Hindu Marriage Act, 1955.
- The Hindu Succession Act, 1956.
- Immoral Traffic (Prevention) Act, 1956.
- The Dowry Prohibition Act, 1961.
- The Maternity Benefit Act, 1961.
- The Medical Termination of Pregnancy Act, 1971.
- Indecent Representation of Women (Prohibition) Act, 1986.
- The Pre-Conception and Pre-Natal Diagnostic Techniques Act, 1994.
- Prohibition of Child Marriage Act, 2007.
- Protection of Women from Domestic Violence Act, 2005.
- Compulsory Registration of Marriage Act, 2006.
- Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013
- The Surrogacy (Regulation) Act, 2021.
- The Assisted Reproductive Technology (Regulation) Act, 2021

Protecting Women's Rights: Role of National Commission for Women

The National Commission for Women (NCW) bears responsibility for carrying out a number of crucial tasks that protect women's rights in India. These duties include (Rai 2017):

- Looking into issues pertaining to the protections afforded to women by the Constitution and other laws,
- Reporting to the Central Government on how these protections are being applied,

- Offering suggestions for how best to implement these safeguards,
- Examining the laws currently in place that have an impact on women, and
- Suggesting changes to correct any inadequacies.

The NCW also handles complaints of women's rights violations, conducts specific research on discrimination and atrocities against women, and takes suo moto notice of matters including deprivation of rights and violations of laws protecting women (Rai 2017). The Commission also contributes to the planning of women's socioeconomic development, assesses the advancement of women's development, examines women's facilities, finances litigation pertaining to women's concerns, and submits reports on a regular basis to the government on topics pertaining to women (Rai 2017). Moreover, the NCW can use civil court-like authorities to enforce its investigations, such as calling witnesses, demanding the production of documents, and establishing commissions to examine evidence (Rai 2017). For women who are victims of violence, the NCW Women Helpline provides a Digital Complaint Registration System that links them to appropriate authorities, including hospitals, police, and One Stop Centres. Helpline's emergency number is 112.

Gender Justice in India: Judicial Activism

The Indian Constitution guarantees various rights to women, socially, politically and economically. Indian courts have reiterated these rights through several landmark judgments. The Supreme Court of India and other High Courts also played an active role in enforcing rights guaranteed under the Indian Constitution. These rights include the safeguarding of women's dignity and the upholding of their equality. The Supreme Court emphasized that sexual harassment at work violates a woman's fundamental human rights and dignity (Punjab and Sind Bank and Others v. Mrs. Durgesh Kuwar). In another case, the Apex Court stated that trafficking women and children for improper purposes is prohibited under Article 23 of the Constitution of India (Raj Bahadur v. Legal Remembrancer to the Government of West Bengal). In a landmark case, the Supreme Court ruled that all women army officers are eligible for permanent commissions, allowing them to hold commanding roles and receive equal treatment in promotions, rank, benefits, and pensions (The Secretary, Ministry of Defence v. Babita Puniya & Ors.).

Interestingly, the Supreme Court of India held that giving preference to a male child violates Article 39A of the constitution and goes against Article 51A (e), which mandates citizens to renounce practices derogatory to women's dignity (Federation of Obstetric and Gynecological Societies of India (FOGSI) v. Union of India & Ors.). While dealing with sexual harassment at

workplace, the Apex Court laid down guidelines for employers to prevent harassment of working women, affirming their right to work without fear of harassment (*Vishakha v. State of Rajasthan*). In landmark case of *Joseph Shine*, the Apex court upheld a woman's right to sexual freedom, citing the right to privacy under Article 21 and declaring Section 497 of the Indian Penal Code, 1860 unconstitutional (*Joseph Shine v. Union of India*).

While striking down discriminatory by-laws of a trade union that prevented qualified women make-up artists from becoming members based solely on their gender, the Supreme Court emphasizing gender justice as integral to the Indian Constitution (*Charu Khurana and Others v. Union of India and Others*). In a matter related to disparity in salaries between men and women, the Apex court also directed the State to ensure parity between women and men teachers in terms of pay and promotional opportunities (*Uttarakhand Mahila Kalyan Parishad v. State of UP*).

In a case related to dowry death, the Apex Court broadened the scope of dowry-death cases, holding that a woman's death from burns or bodily injury within seven years of marriage, coupled with harassment related to dowry demands, should be considered dowry-death (*State of Rajasthan v. Jaggu Ram*). In this matter, a new bride was threatened by her in-laws if her family did not provide a greater dowry (*State of Rajasthan v. Jaggu Ram*). When local villagers protested these threats, the husband's family killed the new bride by burning her with kerosene (*State of Rajasthan v. Jaggu Ram*). This decision aims to curb the rising incidents of dowry-related violence by shifting the burden of proof to the husband's family and providing prosecutors with stronger tools for conviction (*State of Rajasthan v. Jaggu Ram*).

Conclusion

The movie provides a nuanced exploration of women's rights and gender equality issues within the context of patriarchal societies. It illuminates how societal norms and constructs, such as the veil, shape women's identities, restrict their freedom, and perpetuate gender-based discrimination. By portrayal of these issues, the movie prompts reflection on the complexities of women's experiences and the ongoing struggle for gender equality. It emphasises how crucial it is to oppose patriarchal practices and fight for women's rights to equality, freedom, and identity in order to build more diverse and inclusive communities. The movie offers a powerful depiction of the various ways that patriarchal norms and traditions limit women's autonomy. It illuminates the ubiquitous presence of gender-based limitations in familial and social situations through its detailed portrayal of characters and their interactions. The movie skilfully negotiates the delicate issues of gender equality and women's rights, utilising the veil as a potent symbol to oppose patriarchal conventions and promote women's empowerment. Through the journeys of characters like Phool and Jaya, it highlights the transformative potential of asserting one's identity and

challenging societal expectations. On the other hand, the journey of social reform in India, especially concerning women's rights, has been marked by the tireless efforts of visionaries and social reformers of India. Their advocacy for women's education, widow remarriage, and equality laid the foundation for significant legislative changes and judicial activism aimed at safeguarding women's rights. The legal landscape has seen remarkable developments, with stringent laws enacted to combat practices like dowry harassment and domestic violence. Judicial activism, as demonstrated by landmark judgments, has further strengthened the position of women in society, emphasizing gender justice as integral to the Indian Constitution. Moving forward, it is imperative to continue this momentum, ensuring the effective implementation of existing laws and fostering a culture of respect and equality for all genders. Education, awareness, and proactive measures are key in promoting gender justice and creating a society where every individual, regardless of gender, can thrive and contribute to the nation's progress. This movie, as part of that awareness measure, serves as a compelling call to action, urging audiences to embrace the inherent dignity of all individuals, regardless of gender. The removing of the 'veil' to provide women their rights and identity is a crucial aspect of this ongoing journey towards gender equality.

Reference

1. *Charu Khurana and Others v. Union of India and Others*, (2015) 1 SCC 192.
2. *Federation of Obstetric and Gynecological Societies of India (FOGSI) v. Union of India & Ors.*, AIR 2019 SC 2214.
3. *Joseph Shine v. Union of India*, AIR 2018 SC 4898.
4. *Punjab and Sind Bank and Others v. Mrs. Durgesh Kuwar*, I.L.R. [2020] M.P. 1503 (SC).
5. Rai, S. M. (2017). *The National Commission for Women: The Indian Experience*. In *Mainstreaming Gender, Democratizing the State* (pp. 223–242).
6. *Raj Bahadur v. Legal Remembrancer to the Government of West Bengal*, AIR 1953 Cal 522, 57 CWN 507.
7. Singh, R. K., & Dhar, S. (2023). *Women and Criminal Law*. New Delhi: Vinod Publications.
8. *State of Rajasthan v. Jaggu Ram*, AIR 2008 SC 982.
9. *The Secretary, Ministry of Defence v. Babita Puniya & Ors.*, (2020) 7 SCC 469.
10. *Uttarakhand Mahila Kalyan Parishad v. State of UP*, 1993 Supp (1) SCC 480.
11. *Vishakha v. State of Rajasthan*, AIR 1997 SC 3011.

**THE FLIGHT-EX FRAMEWORK: A HUMAN-CENTERED,
AI-COMPATIBLE MODEL FOR MONITORING, LEARNING
AND EVALUATION IN THE PUBLIC SECTOR**

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1. Introduction

More specifically, contemporary societies are undergoing a set of profound and interrelated transformations that have considerably changed the operations, governance, and value creation of the public sector organizations and international development institutions. Included among the most salient of these transformations are growing complexity and uncertainty characteristic of the policy environments, fast and pervasive influence of the digital revolution, and increasing societal demands for accountability, equity, and transparency in public action. These forces do not operate in isolation; rather, they interact in ways that fundamentally reshape institutional priorities, organizational behaviour, and the expectations placed upon public systems.

The nature of public sector work in the current age is that it occurs in a VUCA environment, which stands for volatile, uncertain, complex, and ambiguous. Climate change, pandemics, migration, conflict, and inequality are some of the systemic policy challenges that cut across borders and institutions. In the field of international development, there are several interventions that occur in fragile and conflict-affected states where the capacity to deliver is constrained, the political context is unstable, and decisions have to be made under time constraints.

Simultaneously, the digital revolution has transformed the informational foundations of governance and evaluation. Advances in data infrastructure, artificial intelligence, analytics, and digital platforms have expanded the volume, velocity, and variety of data available to public organizations. While these developments offer unprecedented opportunities for real-time monitoring, predictive analysis, and evidence-informed decision-making, they also introduce new challenges related to data governance, ethical use, algorithmic bias, and institutional capacity. Digitalization has thus amplified both the potential and the risks associated with performance management and evaluation, making it increasingly important to rethink how information is interpreted, acted upon, and embedded within organizational learning processes.

In parallel, societal expectations regarding accountability, equity, and transparency have intensified considerably. Citizens, civil society actors, donors, and multilateral institutions now demand not only demonstrable results but also fairness in process, inclusivity in participation, and ethical integrity in decision-making. Evaluation systems are no longer judged solely by their technical rigor; they are increasingly assessed based on their ability to surface issues of power, representation, trust, and legitimacy. This normative shift has placed pressure on public institutions to move beyond narrow performance metrics toward more holistic approaches that account for human experience, institutional culture, and relational dynamics.

Within this broader context, the field of Monitoring, Learning, and Evaluation (MLE) has itself undergone a significant conceptual and practical evolution. Traditionally, M&E systems in the public sector were designed primarily for compliance, accountability, and upward reporting, emphasizing predefined indicators, log frames, and summative assessments of outputs and outcomes. Such approaches were well suited to stable environments and linear program theories but proved insufficient in contexts characterized by complexity, uncertainty, and rapid change. As Bamberger, Vaessen, and Raimondo (2016) indicate, MLE has transcended the narrow focus on measurement and control. It assumes a broader, more proactive role toward learning, adaptation, and decision support. The modern MLE is seen not merely as a tool of retrospective accountability but as one yielding timely insight into guiding course corrections and sense-making in complex environments. This evolution is well particularly noticed in international development and humanitarian work, where interventions need to adjust endlessly to shifting conditions at every turn, and where delayed feedback can seriously undermine effectiveness.

Crucially, this process of change has brought to the fore the need for timeliness and responsiveness in the practice of evaluation. In fragile and conflict-affected states, where the window of opportunity for intervention may be short and the costs of inaction high, the evaluation cycle may be too long to be of practical use. In this respect, MLE systems are increasingly being asked to provide real-time or near-real-time feedback that can inform operational and strategic decisions as they are being made. This emphasis on timeliness highlights the need for evaluation approaches that are more integrated into organizational processes, and less a function of external exercises. However, despite these advances, many MLE systems are still largely technocratic in their orientation. They continue to emphasize more quantitative indicators, program outputs, and policy outcomes, often to the neglect of the human and organizational factors that influence implementation capacity and institutional performance. Variables such as leadership, organizational culture, employee trust, and stability of the workforce are seldom considered primary evaluative cues, despite their central importance to

learning, adaptation, and impact. Therefore, initial warning signs of institutional distress, morale problems, or trust deficits are often missed until they appear as program failure or organizational collapse.

It is in this space that the reconceptualization of MLE as a human-centered and learning-oriented system is particularly pertinent. In recognizing that institutions learn through people and that the effectiveness of organizations is inextricably linked to the experiences and behaviours of employees, there is a need for a broader evaluative focus. MLE systems must therefore include measures of relational quality, reciprocity, and engagement in organizations, in addition to more traditional measures of performance. This is in line with current thinking on the need for complexity-sensitive, adaptive, and equity-informed approaches to evaluation and provides a basis for the inclusion of human signals in AI-enabled MLE systems. In conclusion, the intersection of societal complexity, the digital revolution, and the need for accountability has completely changed the paradigm of MLE in the public sector and the international development community. MLE is no longer just about what happened; it is increasingly about how institutions can learn, adapt, and make decisions in an uncertain environment. This shift presents both an opportunity and a challenge to redefine what constitutes evaluative evidence and how human signals can be incorporated into learning-oriented evaluation frameworks.

However, despite the conceptual shift in Monitoring, Learning, and Evaluation (MLE) towards more adaptive and learning-focused approaches, many MLE systems in the public sector continue to be structured largely around quantitative outcomes and technocratic reporting obligations. These MLE systems continue to focus on quantifiable outputs, pre-defined indicators, and compliance-based accountability frameworks, often prioritizing that which is quantifiable over that which is meaningful. Although these frameworks may meet the requirements for donor reporting or administrative oversight, they often neglect the human and organizational factors that play a critical role in shaping the effectiveness of implementation.

At the heart of this issue is the constant mismatch between the design of evaluation frameworks and the realities of organizations and their workers. Organizational culture, leadership, trust, and employee turnover factors long recognized as being at the root of organizational decision-making and performance are rarely considered in MLEs as the main source of evaluative information. Instead, these factors are usually treated as secondary variables, often left out of formal monitoring systems altogether. This is indicative of the technocratic approach to evaluation in the public sector, in which complex social and relational processes are considered difficult to measure and are therefore of secondary importance to the objectivity of evaluation.

Classic organizational theorists, such as March and Simon (1958), argued that organizations are more than rational systems, where decisions are determined by formal rules and rewards. Organizational decision-making is necessarily affected by trust, concepts of fairness, leadership credibility, and the stability of social relations. If these are not addressed, the performance of the organization will be impacted, not because of the quality of the decisions, but because of the capacity to implement them. Modern MLE systems disregard all these and are solely concerned with programmatic outcomes, irrespective of the context in which these outcomes are achieved. Organizational culture, in general, is a consideration that plays a significant role in the interpretation and implementation of evaluation results. Organizational cultures that support psychological safety, learning orientation, and communication are likely to perceive evaluation as a process of reflection and improvement. Conversely, cultures of fear, blame, and over-hierarchy are likely to instrumentalize evaluation as a process of compliance. If MLE systems fail to take these considerations into account, they are likely to generate technically correct reports that have no practical impact on organizational behaviour and decision-making. Another important but uninvestigated domain of evaluation is leadership. Leaders are sense-makers who make sense of uncertainty, communicate values of the organization, and set norms around accountability and learning. According to the World Bank (2021), quality leadership in the public sector is directly linked to trust-building, inclusiveness, and ethical leadership. But quality leadership is never investigated as an evaluation concept in MLEs. It can measure the achievement of activities or targets but never measures the impact of leadership on learning, staff, or institutional integrity. Thus, MLEs can overlook the early warning signs of ineffective leadership, which is ultimately reflected in the poor performance of programs and organizations. Trust and employee retention are also pushed to the background in traditional MLE practices. Trust is an important enabling factor that enables coordination, knowledge sharing, and cooperative behaviour in organizations. As trust between employees and organizations breaks down, often due to perceptions of inequity, lack of transparency, and leadership instability, employees become alienated, uncooperative, or seek exit strategies. High employee turnover and disengagement, which are prevalent in the public sector and development agencies, are therefore not only human resource management challenges but also system-level risks that have a direct impact on the quality of evaluation and learning in organizations. Employee turnover regularly compromises institutional memory, data integrity, and interpretive skills required for quality evaluation. The evaluation exercise is highly embedded in tacit knowledge, context, and social relations, which are difficult to codify and transfer. When experienced employees leave, evaluation systems not only lose technical skills but also the tacit knowledge needed to interpret

why certain outcomes were realized and how they can be adjusted in interventions. In this situation, MLE becomes a ritualistic reporting exercise that is disconnected from organizational reality.

In addition, disengaged staff are less likely to engage constructively in MLE processes. Data quality can be compromised if staff view MLE as a negative experience, as punitive or irrelevant to their own professional development. Indicators may be recorded routinely, learning forums may become tokenistic, and feedback cycles may fail. Over time, this can create a vicious cycle: poor evaluation can lead to poor learning and improvement, which in turn can perpetuate staff frustration and disengagement. The fact that these issues persist indicates a profound mismatch between the current purposes of MLE learning, adaptation, and evidence-informed decision-making and the design of current evaluation systems. In neglecting the systematic integration of human and organizational factors as evaluation signals, public sector MLE systems neglect some of the most influential drivers of organizational performance and resilience. This is especially problematic in fragile, high-stakes, or resource-scarce contexts, where staff stability and engagement are critical to maintaining service delivery and adaptive capacity. To fill this gap, there is a need to shift towards more humanistic MLE frameworks that consider organizational culture, leadership, trust, and employee turnover as important considerations rather than afterthoughts. This is in line with the need to address complexity in evaluation and will help to provide a foundation for reframing concepts such as employee disengagement and turnover as warning signs of stress in institutions. This will help MLE to shift from a technocratic reporting function to a more holistic and proactive function that will assist in sustainable capacity development and public service delivery.

Within this dynamic evaluative context, the risk of employee flight, which can be generally defined as the probability that individuals will decide to leave a specific institution within a specific period, must be conceptualized beyond the traditional boundaries of its use as a specific human resource outcome. Rather than being viewed solely as a result of dissatisfaction or labour market dynamics, the risk of employee flight can be more appropriately viewed as a humanistic and systemic construct that is situated within the broader context of Monitoring, Learning, and Evaluation (MLE). The risk of employee flight is more than simply a result of internal personnel processes, but rather an indicator pointing to specific institutional dynamics.

The traditional view appears to conceptualize employee turnover or attrition as an operational problem to be optimized out of existence through transactional means, such as compensation adjustments, selection procedures, or short-term retention bonuses. While these types of remedies may serve to temporarily alleviate symptoms, they often obscure the underlying social

processes that are driving withdrawal intentions in the first place. By contrast, the placement of employee flight risk within an MLE framework calls attention to its use as a diagnostic aid in understanding how people view the overall organizational system, including its values, leadership, and distributive arrangements. At the forefront of this reconceptualization is the concept of reciprocity inherent in employment relationships. Implicit in this concept is the idea of social exchange, whereby reciprocity is viewed as a function of the perceived balance between what employees bring to the employment relationship (such as effort, knowledge, emotional labour, and commitment) and what they receive in return (such as recognition, fairness, development, voice, and ethical treatment). When this state of reciprocity is maintained, employees are more likely to remain committed and engaged, even in difficult or resource-scarce contexts. But when reciprocity is undermined, employees begin to re-evaluate their relationship with the institution, and their exit preparedness and flight risk increase.

Crucially, these erosions of reciprocity do not happen in a vacuum at the individual level but instead operate as a barometer of system-level problems. A persistent or widespread signal of flight risk could, for example, point to a failure of governance in terms of decision-making transparency, accountability, or value statements being at odds with practices. Conversely, a high level of exit preparedness among certain segments of the workforce could point to inequities in terms of gender, race, contract status, or career advancement opportunities that are hidden from view by standard performance metrics. In this way, employee flight risk is a lens through which one can view the distribution of opportunity and security. Ethical leadership is also seen as a consideration that is perceived in the patterns of flight risk. Leadership behaviours convey strong messages about the values of the organization, fairness, and trustworthiness. If leaders are transparent about their actions, act ethically, and show concern for the well-being of the employees, they will strengthen the psychological and moral underpinnings of the employment relationship. Conversely, leadership behaviours that are inconsistent, biased, and display indifference will result in the erosion of trust and hasten withdrawal cognitions. A higher level of flight risk, therefore, can be perceived as a warning signal of ethical distress in leadership systems, which demands evaluative attention before the onset of more overt failures in institutions.

However, the risk of employee flight is also an indicator of the quality of learning environments in the organization. Learning-focused institutions are those that provide conditions that promote reflection, experimentation, and improvement, which in turn enable employees to grow professionally while making meaningful contributions to the organization. On the other hand, learning environments that do not support feedback, error, or learning in favour of compliance

can lead to disengagement and stagnation. Employees who feel that they have no opportunities for growth and voice will have less attachment to the organization, and flight will be a rational adaptive choice. From the MLE perspective, increasing employee flight risk indicates problems with the learning environments of the organization. Crucially, the redefinition of flight risk as an evaluative signal corresponds with the increasing recognition of trust as a key building block of successful public sector performance. Trust is a process that is both an outcome and an enabler of governance, influencing the implementation of policies, the flow of information, and the handling of uncertainty. Trust by employees in the organization, as evidenced by perceptions of fairness, consistency, and mutual commitment, is especially important in the public and development sectors, where intrinsic motivation and alignment with the mission can often offset material limitations. Flight risk, in this respect, serves as an important indirect indicator of the presence and degree of trust embedded in the system.

From an MLE viewpoint, this paradigm shift in the definition of evaluative evidence is widened. Rather than being strictly programmatic or policy outcome-based, evaluators are encouraged to take note of human signals that point to the relational health of institutions. The threat of employee turnover is now a source of “institutional feedback” that gives information on how organizational systems are viewed by those who interact with them daily. If carefully considered, this information can enhance anticipatory learning and allow organizations to identify potential threats before they become a crisis. The purpose of this chapter is to introduce FLIGHT-EX as a human-focused conceptual approach to understanding and applying employee flight risk to public sector Monitoring, Learning, and Evaluation (MLE) systems, with specific compatibility for AI-enabled and data-intensive evaluative contexts. In contrast to viewing employee flight risk as a specific human resource indicator or the predictive outcome of algorithmic models, the FLIGHT-EX conceptual approach views employee exit propensity as a significant evaluative indicator that indicates the underlying relational, ethical, and institutional dynamics at play in public sector organizations. This chapter thus contributes to a people-focused approach to MLE that resonates with current needs for adaptive governance, ethical AI use, and learning-focused evaluation. Theoretically, the framework is grounded in an integrative synthesis of existing organizational and behavioural theories, each of which illuminates different yet complementary aspects of employee-organization relationships. Firstly, Social Exchange Theory, as conceptualized by Blau (1964), is the underlying logic of understanding employment relationships as an exchange process that is guided by perceptions of fairness, obligation, and trust. Underlying this theoretical perspective in the FLIGHT-EX framework is the notion that employees are constantly assessing the balance between their contributions to the organization

and what they receive in return. Imbalances in the exchange relationship, whether material, relational, or symbolic, are the antecedents of disengagement and withdrawal, thereby increasing the risk of flight.

Second, the Psychological Contract Theory (Rousseau, 1995) advances this relational insight by pointing to the implicit and frequently unspoken assumptions that shape employment relationships. In addition to the terms of the formal contract, employees have beliefs about their ethical treatment, personal development, voice, and organizational support. Breach of these expectations leads to a degradation of trust and legitimacy, especially in public sector organizations where intrinsic motivation and mission alignment are key to employee commitment. The FLIGHT-EX framework advances our understanding of these processes by incorporating the dynamics of psychological contracts. Third, Job Embeddedness Theory (Mitchell *et al.*, 2001) adds a structural and contextual element to the framework that explains why people stay in organizations when faced with difficulties. The ideas of links, fit, and sacrifice illustrate how much employees are embedded in their organizational contexts. In FLIGHT-EX, embeddedness is viewed not only as a retention factor but also as an indicator of organizational health and learning. Poor embeddedness indicates poor organizational connections and a lack of investment in developing the workforce, which increases susceptibility to turnover and, in turn, affects evaluative learning.

Besides these underlying theories, the chapter also selectively draws on leadership and signaling theories, especially about AI-mediated organizational contexts. Leadership signaling theories are primarily concerned with how leaders signal the values, priorities, and ethics of the organization through their behaviour, whether intended or unintended. Within the context of digitally mediated environments, where data dashboards, algorithms, and automated decision-making systems are increasingly shaping organizational life, leadership signals are often embedded in technological artifacts themselves. The adoption of AI systems, therefore, can be a highly symbolic indicator of organizational values and priorities with regard to transparency, fairness, and human dignity. FLIGHT-EX draws on this understanding by positing leadership signaling as an important mediator between AI systems and employee trust.

Based on these theoretical foundations, this chapter proposes a conceptualization of employee flight risk as a process of gradually unrolling learning signals in digital and AI-based MLE systems. In contrast to a conceptualization of AI as a predictive technology that is primarily concerned with the individual employee turnover prediction, this conceptualization calls for the use of AI-based analytics to detect patterns of relational distress, governance, and learning

problems at the system level. From this perspective, flight risk analytics are not ending but inputs for learning processes.

The chapter also has implications for the literature on the governance of AI and fair evaluation practice. With the increasing integration of AI systems into public management and evaluation, there has been a concern about the implications of surveillance, bias, opacity, and power imbalances. FLIGHT-EX reduces these implications by pointing to the ethical implications of transparency, proportionality, and human control in the use of flight risk analytics. By situating employee exit propensity in a wider evaluative and governance context, the chapter warns against the simplistic and punitive use of AI and instead advocates for the responsible and learning-oriented use of AI that considers the agency and dignity of employees. Moreover, the framework aligns with the requirements of equity-informed and inclusive MLE. The patterns of flight risk are likely to vary based on gender, contract, and occupational groups, among other factors, which show susceptibility to the risks of precarity, exclusion, or lack of opportunities for advancement. FLIGHT-EX, by considering the assessment of flight risk as an indicator rather than a personal matter, enables the assessor and decision-maker to identify the inequities in the system and make corrections accordingly. In this manner, the framework promotes MLE that not only measures performance but also investigates concerns of equity and inclusion in institutional systems.

Finally, the chapter grounds FLIGHT-EX in the larger information environment that is being constructed through generative technologies. As generative AI alters the landscape of knowledge production, sense-making, and organizational communication, the distinctions between data, interpretation, and action are becoming increasingly fuzzy. FLIGHT-EX provides a conceptual point of reference for making sense of this complexity by highlighting the importance of human experience and trust in evaluative systems. Through the integration of classical organizational theory and contemporary AI concerns, the chapter can help to build MLE frameworks that are both highly advanced and deeply human-centered.

2. Employee Flight Risk as a Human-Centered MLE Construct

Employee flight risk signifies the probability of unescorted change in the organization of the employees within a certain period. Generally, the employee flight risk was treated within the domain of the management of the employees from the particular perspective of employee management in the standard sense. In the broader sense, employee flight risk surpasses the domain of the management of the employees when perceived from the MLE perspective. In the domain of the government and the development sectors, employee flight risk signifies the particular well-being of an organization regarding the complex dimensions of the overall well-

being of the organization in relation to the quality of governance and leaders within the organization.

Conventional Monitoring and Evaluation systems in the public sector have historically emphasized outcome and impact indicators linked to programs and policies, often privileging quantitative performance metrics over lived human experience (Kusek & Rist, 2004). However, scholars of complexity-aware and developmental evaluation argue that such approaches are insufficient for capturing the adaptive and relational dimensions of public institutions (Patton, 2011; Bamberger *et al.*, 2016). Workforce stability, engagement, and retention are not merely operational concerns; they are foundational to institutional memory, policy continuity, and the sustainability of learning ecosystems.

The flight risk represents an important latent evaluative indicator that shows how employees experience fairness, reciprocity, leadership, inclusion, and opportunity within the institutional system from a human-centered point of view. According to the Social Exchange Theory, people are constantly assessing their exchange of inputs with the inducements they receive, a feature that shapes their willingness to continue taking part in, or to withdraw from, the aforementioned exchange (Blau, 1964; Cropanzano & Mitchell, 2005). In the context of a public organization, perceived imbalances usually arise as a result of obscure decision-making, the lack of voices, omission of career growth, and weak accountability in leadership—all factors directly undermining trust in the governance legitimacy.

It is quite analogous that Psychological Contract Theory contributes to our understanding of flying risk in the context of violations in implicit provisions of the security, professional development, ethicalness, respect dimensions of the contract. Violations in these provisions of development / public sector organizations in a context of reforms/resource constraints are common; they are undetectable in classical approaches in the Monitoring & Evaluation space. The higher-flying risk in these settings is indicative, in fact, not just of dissent in the workplace; it is indicative of trust erosion in the institutional context.

Importantly, Job Embeddedness Theory posits that retention is subject to factors other than satisfaction to include bonds, culture, as well as sacrifice in exiting a respective organization or a job as discussed by Mitchell *et al.* (2001). Additionally, from a Monitoring, Learning, and Evaluation approach, a high embeddedness represents a culture of high monitoring ability in an organization, while a low indicates an environment that is perhaps too weak to monitor minimal activity as advocated by the World Bank (2021).

As an anticipatory and a more learning-oriented solution, employee flight risks will thus constitute an essential prospective variable, clearly abandon the more traditional HR

measurements and moving more in the direction of an outcomes-based variable (the way in which issues of institutional effectiveness and integrity in governance and the like should be approached, i.e., OECD, 2021; UNDP, 2022). It is essential that interventions in this area and ultimately in this way are governed by issues of data and the relevant ethics surrounding it to appropriately address issues of countervailing surveillance and inequality issues (surveillances and surveillances-capabilities).

Accordingly, situating flight risk in the context of human-centered approaches to Monitoring, Learning and Evaluation facilitates methodical integration of information from qualitative human experiences and quantitative analytics to ultimately maximize capacity building and governance within the realms of public sector reform.

3. Theoretical Foundations

Importantly, the FLIGHT-EX framework has an underlying foundation encompassing the concepts of organizational behavioural studies, decision science studies, and the views of human capitals concepts joined together by an "integrative theoretical underpinning."

In the context of organizational behaviour, there are various theories, which shape the perspective that the constructs of commitment and withdrawal cognitions among employees can be understood by the perception of achieving a balance of fairness and reciprocity in the context of the employee relationship, as opposed to trust and relationship attachment that feature in theories of social exchange, psychological contract, and job embeddedness theories.

Theoretically, in addition to this understanding of employee retention, contributions within the decision sciences domain as an offshoot of human capital theories illustrate how employees in an organization become instrumental in evaluating the chances of exit in a state of situations that are not certain or in situations of opportunistic variables that include factors of bounded rationality as integral to a scenario in which the employees perceive costs in conjunction with factors of benefits of staying or exiting an organization along with factors ascertaining situations in which there would be a marked scope of marketing the skills set or the options of other avenues to be pursued along with factors of returns in conjunction with investments made in the human capital in a progressive rather than an instantaneous manner in situations of a constrained public sector or developmental context rendering a holistic understanding of the scenario of employee retention through a plethora of theoretical streams in which FLIGHT-EX represents a holistic understanding of the context of employing any theory in understanding the phenomenon in situations of a general context.

3.1 Social Exchange Theory and Psychological Contract

In this regard, the Social Exchange Theory indicates that social exchange has an effect on work relations as employees compare the input and output based on given and provided measures (Blau, 1964). As such, if employees recognize fairness on the treatment side, and then on the regard side, this will likely result in social exchange behavior on the part of employees as they commit to the organization, and if not, they will express negative social exchange as manifested through withdrawal cognitions (Cropanzano & Mitchell, 2005).

The Psychological Contract Theory would thus, in a sense, see itself as a part of this same reasoning, only this time with regard to a belief that each of the concerned parties, in this case, each of the organizations, would engage in (Rousseau, 1995). These would naturally extend well beyond simple contractual agreements, into aspects of perceived fairness, ethical behavior, cooperative growth, etc. The violation of this psychological employment contract thus leads to a trust deficit in which the employees would cause a flight risk by themselves in public sector agencies.

3.2 Job Embeddedness Theory

"Job Embeddedness Theory" tries to explain why people remain in their present situation by exclusively focusing on the extent to which people are "embedded" in their business situation/social situation (Mitchell *et al.*, 2001). There exist three categories of embeddedness that include "link," "fit," and "sacrifice," of which high embeddedness suppresses the opportunities for exiting even if unfavorable satisfaction is experienced to the minimal extent.

Accordingly, with regard to the Monitoring, Learning, and Evaluation approach, embeddedness is related to the robustness of the culture/learning ecosystem. Therefore, where embeddedness is weak in this regard, what we are talking about is the weak institutional environment in the context of 'fragile states and conflict settings,' as expounded by the World Bank (2021).

3.3 Leadership and Signaling Perspectives

Similarly, ideas in 'Leadership Theories,' specifically 'Leader-Member Exchange,' center on how the leader's influence affects employee behavior through the quality of "relational exchanges" by virtue of a direct relationship existing between them, as discussed by Graen & Uhl-Bien in 1995. Leadership style provides a guideline for employees on understanding what management plans in terms of justice and development.

In addition to this, employees generally tend to perceive the transparent, fair, and responsible nature of the organization's management and create an overall picture of basic values within the organization itself through the indication of the Signaling Theory (Spence, 1973). Discrepancies within the organization's management tend to impair the integrity of interactions and thus induce the chances of employee flight risks.

3.4 Decision-Making and Human Capital Perspectives

Decision-making theories view the process of turnover as a psychological model comprising stages of dissatisfaction, formation of intention, alternatives evaluation, and eventual quitting. This perspective of employee turnover process is encapsulated within the general psychological model of decision-making by March & Simon 1958. Human Capital Theory does extend this argument where employees have easily transferable and hence scarce skills. Conclusively, it is pivotal that a workforce should be sensitive to fluctuations in labor-market.

Externally, in terms of the FLIGHT-EX Framework, pull and mobility interact with leading and internal exchange conditions. Employees with strong internal embeddement might enter into 'Exit-Ready' states when faced with external pull and weakened internal exchange and leading conditions.

4. Development of the FLIGHT-EX Framework

The FLIGHT-EX Framework conceptualizes employee flight risk as the outcome of interactions among four core layers and a resulting trajectory.

4.1 Layer I: Exchange Integrity (EI)

Finally, there is the issue of integrity of exchange which entails a general judgment of parties regarding their relational quality in mutual exchange relations with each other—FEMA employee and organization. The process through which this occurs includes perceptions of distributive fairness balance; perceptions of procedural fairness balance; faith in other recipient of the exchange; mutual reciprocal relations; nuturing of expressions of a psychological contract. On account of its base in Social Exchange Theory, integration of exchange in FEMA employees occurs when they base their perceptual awareness of organizational support upon their prior contributions to it.

Therefore, if employees and individuals in other forms of exchange relationship perceive that the exchange integrity is high, this implies that the employees perceive a balance of inputs and receive a feeling of obligation to reciprocate such loyalty and high-performance behavior as affective commitment is increased.

Conversely, erosion of exchange integrity happens when workers feel there is a lack of correspondence between their input variables (such as effort, competence, time spent at work, and emotional strength) and output variables (such as compensation, co-worker acknowledgment, opportunities for progress, and support given by superiors). The continuous experience of these imbalances eventually brings about disengagement behaviors, emotional un-involvement, cynicism, and organizational identification. This will make workers continually re-evaluate their worth staying in the company and thus lead to increased flight risk and turnover intentions.

4.2 Layer II: Leadership Signaling (LS)

Leadership signaling is defined as the "intentional and unintentional signals leadership sends that communicate organizational support and fairness, transparency, and employee development to employees." Additionally, "effective signaling via consistent behaviors such as equitable decision processes, transparent and two-way communication, and efficient use of feedback, as well as advocacy for employees across the organization, makes the leadership symbolic representations of the organization to employees and can serve as an important mechanism through which employees interpret whether the firm truly cares about them, is fair and equitable in dealing with employees in the workplace, and is an authentic and worthy contractual partner both formally and via psychological contract," and thus serves to "mediate employees' experiences" of the aforementioned organizational values and stated concerns.

Importantly, leadership does not drive or impact its effects directly or mechanistically on its members. Rather, it affects how its members make cognitive sense of it. Employees may perceive an organization as having a leadership that acts as a sense-giver—particularly in uncertain or ambiguous organizational conditions. Leadership signals are supportive and manifest a desire to maintain organizational integrity. Therefore, they can make organizational decisions or policies seem fair or just. Thus, the leadership support integrity has a crucial signifying impact or influence as it affects how an employee responds cognitively or emotionally to the organizational leadership.

4.3 Layer III: Embeddedness Capital (EC)

Embeddedness capital represents the stocks of social, cultural, and career-related investments accumulated by the individual worker. The investments are geared towards embedding the individual into the firm and make membership or continued membership desirable. Thus, it involves the quality of relationships or workplace connections with others, the value alignments between individuals and organizations, and the nature of sacrifices made if an individual leaves the firm. Henceforth, as the individual develops healthy relationships with colleagues and the workplace, there is a development in the individual's embeddedness capital. As a result, the employment relationships are less transactional and much more relational.

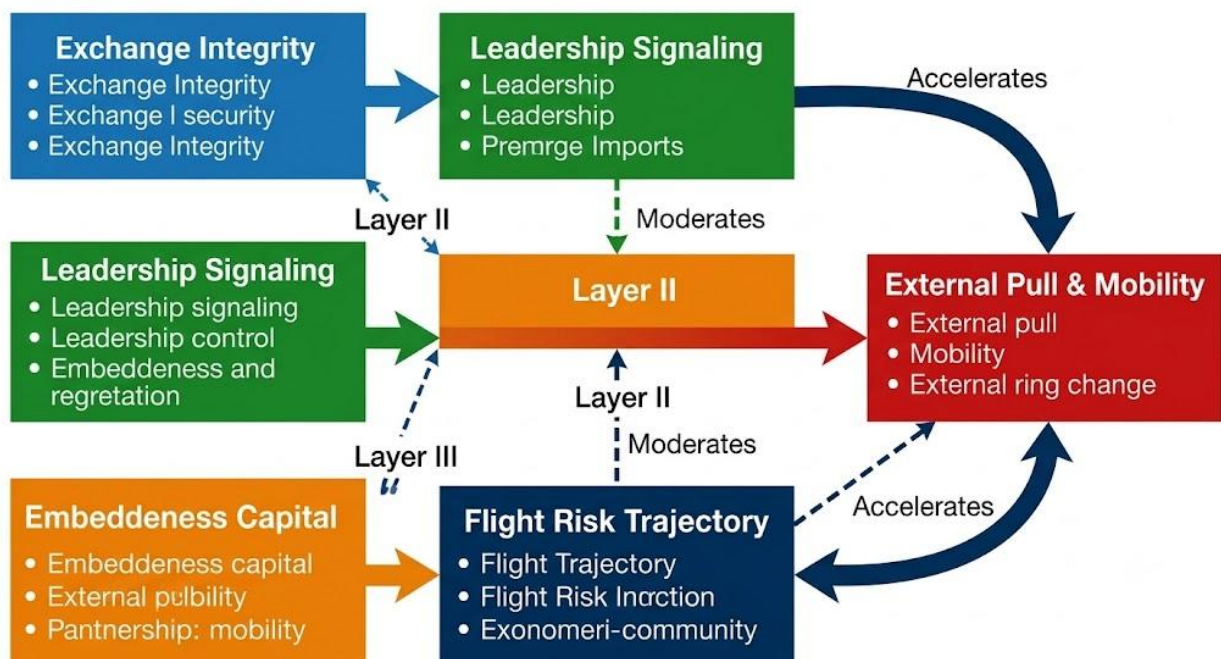
This shows that when there is a high level of embeddedness capital, there is a strong perception that there are economic, social, and psychological costs to exiting. This helps to deter employees from voluntary turnover. Having a set path for employee growth and allowing for skill development and work and life integration initiatives helps to further embed employees and deter voluntary turnover. In other words, embeddedness capital is

negatively related to voluntary turnover because it is a constraint on employee turnover that does not rely on coercion, but rather on embedding meaningful relationships and investing towards a sustainable future.

4.4 Layer IV: External Pull and Mobility (EPM)

The external pull factor or mobility includes employees' perceptions of external employment opportunities outside of their companies. The external employment opportunities include various forms of labor market signals, which include employees' perceptions of labor demand in specific skills or market ease of mobility between or among companies or even sectors. Generally, employees with high human capital or skills benefit from external forces because of their high professional reputation created by good market conditions or labour market signals that increase their sense of employability in alternative situations or companies.

This dependent relationship between external pull and flight risk is said to be subject to certain internal organizational variables. Thus, it is mentioned that as long as high exchange integrity persists along with high leadership signals and high embeddedness capital, external pull is seen but not acted upon in an organizational situation. Conversely, in certain situations where internal organizational variables are seen declining and are evidenced through perceptions of fairness concerns, low growth opportunities, and poor leadership signals, external organizational pull culminately catalytically converts underlying dissatisfaction into actual turnover intentions. Thus, it is seen that external organizational pull and flight risk have a conjoint function in flight risk and are not culminately seen as enhancing turnover in response to unfavourable employment experiences in an organizational situation.



The FLIGHT-Ex framework: A multi level model of employee flight risk

5. Flight Risk Trajectories

Rather than treating turnover as a binary outcome-stay or leave-the FLIGHT-EX Framework conceptualizes flight risk as a dynamic and progressive process. It recognizes that employees move through distinct trajectories before the actual exit occurs. This trajectory-based perspective captures variation in employees' psychological states, behavioral signals, and labor-market positioning, enabling a more nuanced understanding of how turnover intentions evolve over time. By integrating internal employment conditions with the external mobility forces, the framework re-conceptualizes flight risk as an ongoing risk state rather than as a discrete event. The framework proposes four flight risk trajectories.

- Stable Anchors have high exchange integrity and embeddedness capital, and low external pulls, making their flight risks extremely low and exchange integrity high.
- Silent Drifters show a weakening of interest/interaction integrity yet exhibit behavioural passivity due to a lack of opportunities from external sources.
- Active Explorers experience moderate levels of dissatisfaction with growing labour market scanning and job search behaviours, reflecting their highest yet unstable level of risk.
- Exit-Ready Movers are deemed the critical trajectory as they manifest high turnover intentions, high external mobility, and show high propensities of exit behaviours. By recognizing these categories of leaving behaviour, the FLIGHT-EX Framework allows groups and organizations to execute specific interventions during stages of turnover behaviour before it turns into turnover.

6. Hypothesis Development and Implications for Research

It has also been identified that the hypotheses utilising the FLIGHT-EX framework are empirical in nature as these could be conducted within the context of cross-sectional as well as longitudinal methods of researching the subject. Further to this, multiple measures could be used to conduct the exchange integrity measures, the exchange leadership signs, the embedded capital measures, and the external factors using scale measures or the use of human resources analytics measures. Further to this, the use of either the structural equation models, the multilevel models, or the machine learning methods could be used to examine the complex interaction effects through the FLIGHT-EX model in an appropriate manner.

7. Implications for Research

Moreover, the FLIGHT-EX Framework presents various possibilities and venues for investigating further and more intensively both theoretically and empirically how employee

flight risks can be more rigorously examined and understood in the workplace. Different studies can test the postulated associations through longitudinal and panel study designs to study the evolution and development of exchange integrity, signaling leadership, embeddedness capital, and external pull forces over time. Different sources and methods to generate data, including employee and supervisor self-reports and organizational data, can greatly reduce common method biases and ensure an expansive and comprehensive measurement and examination of all the postulated concepts and consequences by the present framework.

The framework also invites integration with HR analytics and machine-learning-based predictive models to estimate individualized flight risk probabilities and to identify early warning signals of trajectory shifts. Future research might model nonlinear interactions among internal and external risk factors using algorithmic approaches such as survival analysis, neural networks, or ensemble learning. Cross-sectoral applications across public, private, and nonprofit organizations, along with cross-cultural validation across institutional and national contexts, would enhance the framework's generalizability and practical relevance. Such extensions would place the FLIGHT-EX Framework as a robust platform for advancing theory, analytics-driven practice, and evidence-informed workforce decision-making.

7. Managerial and HR Analytics Implications

As far as practitioners are concerned, the FLIGHT-EX model paradigm underscores this basic fact: "Effective retention approaches go far beyond frequency of pay increases or open-ended counteroffers. Indeed, while money is not irrelevant within the excitement transfer paradigm, it is not a primary contributor within the fundamental model of social exchange. With respect to the influences of implied promotional arrangements along with possible skill development tracks, as well as workplace friendships on maintaining embeddedness, a strong implication is seen regarding the importance of leader development efforts having a preventive effect on maintaining the integrity of the exchange in the absence of flight risk."

The framework has thus emphasized the importance of systemically monitoring labour market conditions outside the organisation in workforce risk management. The HRAS could draw upon all the relevant labour or organisation-related indicators across all three tiers of the framework in building their early warning system; this could include metrics on employee engagement or perceived justice in a system of exchange integrity, leader effectiveness metrics in the leader effectiveness tier, internal labour mobility or tenure metrics in the built-in asset capital, recruiter activity or skill demand metrics in the external labour supply tier. The FLIGHT-EX Framework thus helps labour or human resource management organisations potentially move beyond reactive labour turnover prevention, into proactive labour talent management.

Conclusion

With increasing complexity in what demands are now in the way of public sector organizations and their developers, it has become extremely important that as demands continue to grow on what demands are now in the way of public sector organizations and on what demands are now in the way of public sector organizations and their developers, "human anchoring, flexibility, and integrity" are what "Monitoring, Learning, and Evaluations" ought to be. The existing conventions through which "M&E" has engaged and administered using what utility they've established in providing necessary "importance" has now become unable to "appropriately recognize" even early signs of "institutional stresses" because they frequently "involve issues of human experience, leadership, and culture." Such a situation would even pose more issues in "fragile states" and in "conflict situations" because of what "workforce volatility" means in terms of "trust."

This chapter reframed employee flight risk as a type of evaluative signal in strategic evaluation; meanwhile, the proposed FLIGHT-EX Framework provided a multi-level framework for enhancing public sector-based MLE systems; by incorporating exchange integrity indicators, leadership signaling indicators, embeddedness capital indicators, and external forces of mobility within the model, this framework is closely aligned with learning-oriented evaluation paradigms; additionally, this framework's reliance on a more trajectory-based system allows for enhanced learning-oriented evaluation to facilitate more anticipatory learning processes for institutions.

Importantly, the FLIGHT-EX Framework has been developed in a manner that not only makes it compatible with AI-assisted systems of evaluation but also incorporates major issues with regards to data ethics, data privacy, and data transparency in AI utility and AI usage. A case in point with regards to its utility must be its ability to promote governance and trust within a context where participative, equity-informed, and gender-aware designs of evaluation are a part of its integration with regards to risk analytics.

In that sense, this chapter helps advance the nascent body of learning ecosystems, cultural learning, and capacity-institutionalist learning through its illustration of how human signalization might factor into future M&E platforms. Encouragement is given to future researchers and practitioners to extend this work through testing and applying the FLIGHT-EX Framework within various public sector organizations, UN agencies, and partners to build a more people-centered and ethical MLE system suitable to a post-generative AI era.

References

1. Bamberger, M., Vaessen, J., & Raimondo, E. (2016). *Dealing with complexity in development evaluation: A practical approach*. Sage.

2. Bamberger, M., Vaessen, J., & Raimondo, E. (2023). *Dealing with complexity in development evaluation: A practical approach* (2nd ed.). SAGE Publications.
3. Blau, P. M. (1964). *Exchange and power in social life*. Wiley.
4. Cropanzano, R., & Mitchell, M. S. (2005). Social exchange theory: An interdisciplinary review. *Journal of Management*, 31(6), 874–900. <https://doi.org/10.1177/0149206305279602>
5. European Commission. (2020). *Ethics guidelines for trustworthy artificial intelligence*. European Union.
6. Kusek, J. Z., & Rist, R. C. (2004). *Ten steps to a results-based monitoring and evaluation system*. World Bank.
7. March, J. G., & Simon, H. A. (1958). *Organizations*. Wiley.
8. Mitchell, T. R., Holtom, B. C., Lee, T. W., Sablinski, C. J., & Erez, M. (2001). Why people stay: Using job embeddedness to predict voluntary turnover. *Academy of Management Journal*, 44(6), 1102–1121. <https://doi.org/10.2307/3069391>
9. OECD. (2021). *OECD principles on artificial intelligence*. OECD Publishing. <https://doi.org/10.1787/ca9c8c41-en>
10. OECD. (2020). *Strengthening governance of critical risks: Resilience strategies and responses to COVID-19*. OECD Publishing. <https://doi.org/10.1787/bb0f4c0a-en>
11. Patton, M. Q. (2011). *Developmental evaluation: Applying complexity concepts to enhance innovation and use*. Guilford Press.
12. Rousseau, D. M. (1995). *Psychological contracts in organizations: Understanding written and unwritten agreements*. Sage.
13. UNDP. (2022). *Systems thinking and complexity in evaluation*. Independent Evaluation Office, United Nations Development Programme. <https://www.undp.org/evaluation/publications/systems-thinking-and-complexity-evaluation>
14. World Bank. (2021). *World development report 2021: Data for better lives*. World Bank.

INNOVATIONS IN COMMERCE AND SOCIAL SCIENCES

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Abstract

The modern world has seen innovations in commerce and the social sciences that have greatly changed the operation of economies and how societies evolve. Digital technologies and globalisation, combined with data-driven decision-making, have redefined traditional business models and social structures. This chapter discusses recent developments in business, such as e-commerce, digital finance, and platform economies, as well as social science innovations, such as behavioural economics, social analytics, and policy innovation. It highlights the significance of interdisciplinary methods for comprehending and responding to complex socio-economic issues. The chapter, by examining recent developments and case studies, highlights the need for innovation to support economic growth, social equity, and sustainable development. It also explores issues surrounding technological disruption, including inequality, data privacy, and ethics. At the end of the chapter, the future perspectives of research and practice in the field of commerce and social sciences are described.

Keywords: Commerce, Social Sciences, Innovation, Digital Economy, E-Commerce, Behavioural Economics, Social Analytics, Globalization, Sustainable Development.

Introduction

The fields of commerce and social sciences have undergone profound transformations in recent years, driven by technological advancements, globalization, and changing societal needs. Commerce, traditionally centered on trade and business activities, has expanded to include digital platforms, global supply chains, and innovative financial systems. At the same time, social sciences have evolved to incorporate new methodologies and interdisciplinary approaches that enhance our understanding of human behaviour, social structures, and economic systems.

The convergence of commerce and social sciences has created new opportunities for innovation and development. Digital technologies, such as the internet, mobile applications, and data analytics, have enabled businesses to operate more efficiently and reach broader markets. Meanwhile, insights from social sciences have improved decision-making processes, policy

formulation, and organizational behaviour. This integration has become essential for addressing complex challenges such as economic inequality, social inclusion, and sustainable development.

Objectives

This chapter aims to explore key innovations in commerce and social sciences and examine their impact on economic and social development. It seeks to analyse emerging trends, identify challenges, and propose strategies for leveraging innovation to achieve sustainable and inclusive growth.

Methodology

The chapter is based on a comprehensive review of recent literature published between 2020 and 2025, including academic journals, books, and policy reports. A qualitative approach was used to analyse innovations in commerce and social sciences. Key themes such as digital transformation, behavioural insights, and policy innovation were identified and examined. Comparative analysis and case study evaluation were conducted to understand the practical implications of these innovations. The findings were synthesized to provide a comprehensive perspective on the evolving relationship between commerce and social sciences.

Innovations in Commerce

Commerce has been revolutionized by the adoption of digital technologies and innovative business models. E-commerce platforms have transformed the way goods and services are bought and sold, enabling businesses to reach global markets with minimal physical infrastructure. Digital payment systems and financial technologies (fintech) have improved transaction efficiency, increased financial inclusion, and reduced reliance on traditional banking systems.

The emergence of platform economies, where digital platforms act as intermediaries between buyers and sellers, has reshaped market dynamics. Companies leverage data analytics to understand consumer behaviour, optimize operations, and enhance customer experiences. Supply chain innovations, including automation and real-time tracking, have improved efficiency and resilience, particularly in response to global disruptions.

Sustainability has also become a key focus in modern commerce. Businesses are adopting green practices, circular economy models, and corporate social responsibility initiatives to address environmental and social challenges. These innovations not only contribute to sustainability but also enhance brand value and competitiveness.

Advancements in Social Sciences

Social sciences have experienced significant advancements through the integration of new methodologies and technologies. Behavioural economics, which combines insights from

psychology and economics, has improved our understanding of decision-making processes and consumer behaviour. This knowledge is widely applied in marketing, policy design, and organizational management.

Social analytics, powered by big data and artificial intelligence, enables researchers to analyze large datasets and identify patterns in social behaviour. This approach has enhanced the ability to address issues such as public health, education, and social inequality. Policy innovation, which involves the use of evidence-based approaches and experimental methods, has improved the effectiveness of public policies and governance.

Interdisciplinary research has played a crucial role in advancing social sciences. By integrating perspectives from economics, sociology, psychology, and political science, researchers can develop comprehensive solutions to complex social problems. This approach is essential for addressing global challenges such as poverty, climate change, and social justice.

Integration of Commerce and Social Sciences

The integration of commerce and social sciences has led to the development of innovative solutions that address both economic and social challenges. Businesses increasingly rely on social science insights to understand consumer behaviour, design effective marketing strategies, and improve organizational performance. At the same time, social scientists use data and tools from commerce to analyse economic trends and inform policy decisions.

This integration has also facilitated the development of inclusive business models that prioritize social impact alongside economic growth. Social enterprises and impact-driven organizations aim to address societal challenges while maintaining financial sustainability. These models demonstrate the potential of combining commercial innovation with social objectives to achieve sustainable development.

Discussion

The innovations in commerce and social sciences have created significant opportunities for economic growth and social development. However, they also present challenges that require careful consideration. Issues such as data privacy, ethical concerns, and digital inequality must be addressed to ensure that the benefits of innovation are distributed equitably. The rapid pace of technological change requires continuous adaptation and learning, both for individuals and organizations.

Collaboration between businesses, governments, and academic institutions is essential for maximizing the potential of these innovations. By fostering partnerships and promoting knowledge sharing, it is possible to create systems that are both efficient and inclusive.

Challenges and Limitations

Despite the progress made, several challenges hinder the effective implementation of innovations in commerce and social sciences. These include technological barriers, lack of infrastructure, and limited access to resources in developing regions. Data security and privacy concerns remain significant issues, particularly with the increasing use of digital platforms. Additionally, the complexity of integrating different disciplines and technologies can create challenges in implementation.

Addressing these challenges requires coordinated efforts from policymakers, businesses, and researchers. Developing regulatory frameworks, investing in infrastructure, and promoting digital literacy are essential for overcoming these limitations.

Future Prospects

The future of commerce and social sciences will be shaped by continued technological advancements and interdisciplinary collaboration. Emerging technologies such as artificial intelligence, blockchain, and the metaverse are expected to further transform commerce and social interactions. These technologies have the potential to create new business models, enhance transparency, and improve efficiency.

In social sciences, the use of advanced analytics and experimental methods will continue to improve our understanding of human behaviour and social systems. The integration of commerce and social sciences will play a critical role in addressing global challenges and achieving sustainable development goals. Emphasis on ethical practices, inclusivity, and sustainability will be essential for shaping the future.

Conclusion

Innovations in commerce and social sciences are driving significant changes in the way economies function and societies evolve. The integration of digital technologies, data-driven insights, and interdisciplinary approaches has created new opportunities for growth and development. However, addressing challenges related to inequality, ethics, and sustainability is essential for ensuring that these innovations benefit all members of society.

By fostering collaboration, promoting responsible innovation, and investing in research and education, it is possible to harness the full potential of these advancements. The future of commerce and social sciences lies in their ability to adapt to changing conditions and contribute to a more sustainable and inclusive world.

References

1. Brynjolfsson, E., & McAfee, A. (2022). *The Second Machine Age*.
2. Porter, M. E. (2023). *Competitive strategy and innovation*.

3. Thaler, R. H. (2021). *Behavioural Economics and Decision Making*.
4. OECD (2024). *Digital economy and social innovation report*.
5. World Bank (2023). *Global economic prospects*.
6. UNDP (2024). *Human development and social innovation*.
7. Acemoglu, D., & Robinson, J. A. (2023). *Why Nations Fail*.
8. Kotler, P. (2022). *Marketing 5.0: Technology for Humanity*.
9. Tapscott, D. (2023). *Blockchain Revolution*.
10. Sen, A. (2021). *Development and social justice*.
11. Goleman, D. (2021). *Emotional intelligence in organizations*.
12. Varian, H. R. (2022). *Big data and economic analysis*.
13. Kahneman, D. (2022). *Thinking, Fast and Slow*.
14. World Economic Forum (2025). *Future of commerce and society*.
15. United Nations (2024). *Sustainable development goals report*.

ORGANIZATIONAL TRANSFORMATION THROUGH GENERATIVE ARTIFICIAL INTELLIGENCE: A REVIEW STUDY

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Abstract

Generative artificial intelligence technology refers to the latest technological innovation that can transform organizational structures, operations, and decision-making. Unlike regular AI systems that focus on automation, prediction, and pattern recognition, generative AI technology creates new knowledge by using complex machine learning models including large language models (LLMs), GANs, and transformers. Generative artificial intelligence has been rapidly adopted in India and will continue revolutionizing various industries including banking, healthcare, manufacturing, education, retail, and government administration. This study provides a systematic review of the existing literature related to the influence of GenAI in organizational transformation. This study discusses key factors that motivate organizations to adopt the innovation, its impact, and possible drawbacks. Literature suggests that GenAI increases organizational efficiency, capacity to innovate, customer engagement, and flexibility in making decisions. However, there are risks related to data protection, ethical use of AI, replacement of human employees with intelligent machines, and regulatory challenges. Organizations in India adopt GenAI as a way of becoming more competitive in the world of digital technologies. Though the process of digital transformation requires proper leadership, technological infrastructure, and reskilling of employees among other strategies.

Keywords: Generative Artificial Intelligence, Organizational Transformation, Digital Transformation, Artificial Intelligence Adoption.

Introduction

The emergence of AI technology has seen many changes emerge within the organizational environment including the competition, innovation, and management. Among the emerging technologies, the one that has gained prominence because of its capabilities of creating texts, images, code, music, among other products resembling those created by humans, is the Generative Artificial Intelligence (GenAI). Using machine learning models such as the large language models, transformers, and the deep neural networks, GenAI has seen organizations automated, and creativity fostered.

Currently, organizations worldwide are using GenAI to improve efficiency, enhance business process, deliver improved customer experience, and innovate. This makes GenAI an important technology that assists organizations transform by ensuring a shift in the structure, strategy, culture, and operation of an organization. The primary aim of this transformation is to ensure sustainability and competitive advantage. Unlike other digital tools, GenAI enables the enhancement of human intelligence and helps make decisions.

There are several specificities associated with GenAI and organizational aspects related to its use in India. First of all, it is worth mentioning that India can be regarded as one of the countries demonstrating the highest rate of growth and actively investing in digital technologies, such as cloud computing, big data analytics, and artificial intelligence. Indian Government has taken various initiatives, including Digital India, Startup India, and National Strategy for Artificial Intelligence, it becomes possible to establish appropriate conditions for GenAI implementation in various spheres of organizational operations. Enterprises, startups, and governmental organizations have started using GenAI in fields such as customer service, financial analysis, health care diagnostics, education, software development, and logistics. At the same time, there are numerous challenges that may emerge because of GenAI implementation that should be mentioned.

In light of the fast-paced nature of GenAI and its increasing role in influencing organizational processes, there is an urgent need for reviewing the available literature comprehensively. This systematic review intends to analyse the current state of knowledge concerning the effects of Generative AI on organizational transformation. The paper discusses the factors that encourage adoption, opportunities associated with such adoption, challenges and possible future developments.

India's GenAI Corporate Evolution

GenAI is being adopted rapidly, which is paving the path to an organizational revolution in India with firms moving away from their traditional method of labor-based cost arbitrage toward capability arbitrage. GenAI has taken root inside the organization in terms of software development, IT, data analysis, and customer engagement (Yavetz & Nakash, 2026). According to a report by Snowflake, close to 71% of firms in India derive value from their GenAI investment, which is more than the global average of less than this number (Desk & Cio, 2026).

The new strategic orientation includes not only Agentic AI (autonomous workflows), but also specific Retrieval-Augmented Generation (RAG) architectures that allow safely utilizing institutional proprietary knowledge bases (Osmond, 2026). This development goes beyond simply improving productivity; this is a complete rethinking of the labor force in India.

Enterprises are beginning to transform hierarchical corporate structures, reduce historical technical debt, and emphasize ongoing education of employees. Through the massive development of locally trained foundational models of AI that support Indic languages, India is building itself as not only a global export center of back-office operations but also a hub of sovereign enterprise AI development (Dhir & Verma, 2024).

Drivers of Generative AI Adoption in Indian Organizations

Rapid adoption of Generative Artificial Intelligence (GenAI) within Indian companies has been propelled by an unusual blend of strategic requirements, technological preparedness, and economic benefits (Singh *et al.*, 2026). Some important factors can be seen as major triggers for the transition from pilots to production deployments.

India's robust cloud infrastructure and advanced data capabilities mean that there is no need for any kind of system rework in order to implement GenAI. Additionally, the technical capabilities translate to direct commercial confidence, as a mind-blowing 93% of Indian companies anticipate positive ROI in just three years, which is far above the global average (The Economic Times, 2025). It is quite significant that the financial motivation and ability to cut costs with automation means that it is an obvious decision.

India is home to 16% of the world's AI workforce, which means that companies can take advantage of the vast network of more than 600,000 digital workers available in India (India Today, 2026). Moreover, companies will be able not only to use off-the-shelf software but also develop domain-specific LLMs and AI agents. There is a strong domestic development environment represented by companies like Sarvam AI and strong government support via the IndiaAI Mission.

Operational level sees firms harnessing the power of GenAI to tackle various organizational roadblocks (Sharma *et al.*, 2026). From tech companies to retail businesses and banks, these firms are making use of multi-modal AI to automate workflow intelligently and offer highly personalized customer service in real time and to detect fraud at lightning speed. Delegation of such tasks to AI copilots helps Indian firms tremendously increase human productivity and allows them to focus on innovation.

Impact of Generative AI on Organizational Transformation

The emergence of GenAI will fundamentally transform the corporate way of doing things by replacing the incremental approach of transformational changes in the organization with a revolutionary one that reengineers everything about the way in which modern organizations conduct business (Şahin & Karayel, 2024).

GenAI eliminated the hierarchical structure that has dominated for so long within corporations together with an utter transformation of conventional workflows. Companies are quickly shifting from siloed structures to highly dynamic multi-disciplinary squads driven by AI co-pilots. Therefore, leveraging AI for data processing, coding, and basic content creation, corporations can experience huge gains in efficiency and effectiveness, which transforms employees into editors rather than doers (Tiwari, 2024).

GenAI offers companies the ability to reinvent entire customer-facing business models. Within functions such as marketing, customer service, and product development, companies are now able to leverage unstructured data pools in real time (Singh *et al.*, 2024). Hyper-personalization becomes possible because of the immediate adjustment to customers' feedback that leads to product modifications or marketing campaigns developed in a matter of hours as opposed to months. Furthermore, GenAI makes decision-making processes very predictive; executives employ simulators powered by GenAI to identify market disruptions and test their corporate strategies.

While the benefits of GenAI lie in operational efficiency, the technology serves as an extremely powerful R&D accelerator as well (Santoro *et al.*, 2026). Whether it discovering new molecular structures in the pharmaceutical industry or developing customized risk algorithms in financial services, GenAI greatly reduces the innovation cycle, making it possible to develop new AI-powered offerings much faster than ever before.

Workforce Implications of Generative AI

The adoption of GenAI in the international workforce environment has resulted in a major shift in the way that humans work, shifting the use of GenAI from a futuristic addition to a regular part of the workforce team (Ashfin, 2024). In doing so, the effect that this has had on the workforce environment is reflected in three aspects.

Nowadays, the concept of "work" is changing from basic content creation to more strategic thinking. GenAI technology easily takes care of tasks such as drafting of codes, generating extensive research reports, and writing marketing content (Mäntysaari, 2025). This has caused people to enter into the positions of editors and directors. The key skills required in this scenario include not just the performance, but contextual thinking, domain knowledge, and prompt engineering.

As technical constraints become more minimal, the premium on corporations is becoming more and more human. Whereas AI systems can crunch numbers at unmatched speeds, there is no way for them to mimic emotional intelligence, ethical decision-making, leadership skills, or intricate cross-functionality. Companies are reacting quickly by implementing internal reskilling

initiatives, aimed at developing digital literacy in the workforce. This means training employees how to utilize AI technology to delegate administration to it, thus freeing up mind power to fully focus on strategy and creativity (Yin & Hoang, 2026).

While the prospect of massive and irremediable unemployment hangs on the horizon, the facts suggest that the change in question is a profound transformation of the jobs in question, not their total disappearance (Campa, 2019). Many entirely new career opportunities emerge at a dizzying speed as AI ethicists, workflow automators, model trainers, and chatbot designers (Le, 2024). While simple jobs with repetitive character can be greatly reduced, the history proves that any technological revolution spawns a completely new economy.

Conclusion

GenAI has turned out to be one of the revolutionary developments in recent times which has brought in radical changes in organizational structure, processes, and capabilities across India. This review suggests that Indian organizations are gradually shifting from labor-cost arbitrage models to capability-driven models wherein artificial intelligence (AI) becomes a driving force for efficiency, knowledge creation, and competitive advantage. The deployment of GenAI in fields like banking, health care, manufacturing, education, retail, and information technology suggests its wide range of applications and transformative nature.

It is observed that GenAI brings about improvements in organizational performance through intelligent automation, data-driven decisions making, personalization in customer engagement, and faster innovation cycles. Advanced technologies like LLMs, agentic AI, and RAGs are being deployed by Indian organizations for enhancing organizational agility and strategic flexibility. Additionally, several other factors like government efforts, robust digital infrastructure, abundance of AI expertise, and thriving startup environment have made India a potential player in AI-enabled organizational transformation at a global level.

Some problems that are associated with the implementation of GenAI have been noticed. Problems like data privacy, cyber security, algorithmic bias, ethical governance, labor replacement, and lack of regulatory policies are essential factors in the process of implementing strategies within organizations. Reskilling of employees and development of the right AI governance framework are important to change the way of doing business. Thus, organizational transformation requires not only technology but organizational readiness and training of human capital. Transformation of organizations in India would definitely include development of advanced GenAI technologies in the future. Autonomous AI agents, multimodal AI systems, and specialized AI foundation models would be developed for decision-making and process automation. Local solutions would make these technologies available to people in India.

The future scope of research in this area can emphasize measuring the effects that GenAI might have on organizations, analyzing the adoption of the technology sector-wise, and exploring strategies for adapting the workforce. Additionally, more effort must be made toward creating frameworks related to ethical and governance principles of AI. With increasing investment in India's digital infrastructure, development of AI skills, and innovation ecosystems, it is expected that GenAI will prove to be a key technology in developing smart and adaptive organizations. Though, the success of implementing GenAI can help in positioning India as a leader not only in adopting AI technologies but also in contributing to their evolution.

References

1. Ashfin, U. (2024). From Automation to Augmentation: How Generative AI Is Reshaping the Global Workforce. *British Journal of Multidisciplinary Studies*, 2(1), 08-15.
2. Campa, R. (2019). Three scenarios of the future of work: Technological unemployment, compensation, hollowing out. *Sociology and Technoscience (Sociología y tecnociencia)*, Vol. 9, Issue 2.
3. Desk, E., & Cio, E. (2026). Snowflake research reveals 71% of Indian firms see positive ROI from Gen AI. *ETCIO.com*. <https://cio.economicstimes.indiatimes.com/news/artificial-intelligence/snowflake-research-reveals-71-of-indian-firms-see-positive-roi-from-gen-ai/129535497>
4. Dhir, M., & Verma, S. (2024). *AI for good: India and beyond: Detailed analysis of AI & laws, policies, ethical frameworks and judgements*. Notion Press.
5. India Today (2026). *16% of world's AI workforce is now in India*. <https://www.indiatoday.in/jobs/story/16-of-worlds-ai-workforce-is-now-in-india-educ-2884326-2026-03-19>
6. Le, H. (2024). *The Evolving Role of Programmers in an AI-Chatbot Dominated World: Challenges, Adaptation Strategies, and Future Prospects*. University of the Cumberlands.
7. Mäntysaari, K. (2025). *GenAI assisted incremental innovation and practices* (Bachelor's thesis, K. Mäntysaari).
8. Osmond, M. (2026). Agentic AI, Retrieval-Augmented Generation, and the Institutional Turn: Legal Architectures and Financial Governance in the Age of Distributional AGI. *arXiv preprint arXiv:2603.13244*.
9. Şahin, O., & Karayel, D. (2024). Generative artificial intelligence (GenAI) in business: a systematic review on the threshold of transformation. *Journal of Smart Systems Research*, 5(2), 156-175.

10. Santoro, G., Centraco, G., Christofi, M., & Ključnikov, A. (2026). Reframing growth hacking in resilient startups: the role of generative AI in experimentation, decision-making and learning. *Management Decision*, 1-21.
11. Sharma, A. J., Rathore, B., Biswas, B., Xiao, X., & Gupta, R. (2026). Generative AI Implementation in Enterprises: Lessons From a Case Study of Enhanced IT Service Management. *Information Systems Journal*.
12. Singh, N., Chaudhary, V., Singh, N., Soni, N., & Kapoor, A. (2024). Transforming business with generative AI: Research, innovation, market deployment and future shifts in business models. *arXiv preprint arXiv:2411.14437*.
13. Singh, R., Khan, S., Joshi, A., Katragadda, R., & Kumar, V. (2026). Exploring the role of artificial intelligence on business innovation and entrepreneurship. *Strategy & Leadership*, 54(3), 302-322.
14. The Economic Times (2025). *India high on AI optimism, 93% firms expect positive returns in three year*. <https://economictimes.indiatimes.com/tech/artificial-intelligence/india-high-on-ai-optimism-93-firms-expect-positive-returns-in-three-years-report/articleshow/125536617.cms?from=mdr>
15. Tiwari, A. (2024). Custom AI models tailored to business-specific content needs. *Jurnal Komputer, Informasi dan Teknologi*, 4(2), 21-21.
16. Yavetz, G., & Nakash, M. (2026). Adopting GenAI applications in the workplace: managerial implications and insights from ICT professionals. *EuroMed Journal of Business*, 1-19.
17. Yin, J., & Hoang, K. D. (2026). AI-enabled knowledge renewal: the role of leaders' AI attitudes and unlearning in enhancing employees' creative performance. *Journal of Knowledge Management*, 30(1), 211-230.

THE WORSHIP OF EKAVIRA GODDESS DURING THE KAKATIYA PERIOD: HISTORICAL PERSPECTIVE

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Abstract

This study examines the worship of the goddess Ekavira (identified with Renuka/Yellamma/Mariamman) in the Kakatiya period (c. 1000–1323 CE) within the broader political and cultural landscape of medieval Andhra. Drawing on literary evidence such as Vallabharaya's Kridabhiramam and references in Koravi Goparaju's works, it traces Ekavira's urban presence in Warangal and her wider rural cult networks in Telangana and coastal Andhra. The paper situates Ekavira within a plural religious field—dominant Shaivism and Vaishnavism, resilient Jain and Buddhist residues, and the contemporaneous Virasaiva movement—highlighting processes of localization, syncretism, and social negotiation. Origin myths (Renuka-Jamadagni-Parashurama cycle; Brahmin–untouchable marriage trope) illuminate the goddess's liminal identity and her role in mediating caste hierarchies, purity/pollution, and village protection from epidemics. Rituals demonstrate a non-elite religious economy that coexisted with Brahmanical temple culture. Ekavira's festivals and narrative performances functioned as communal technologies to cool divine wrath, mark territorial sovereignty, and redistribute prasadam as symbolic social cohesion. Overall, Ekavira worship reveals how subaltern agency, regional literary memory, and shifting political patronage shaped a durable goddess tradition across Kakatiya Andhra.

Keywords: Ekavira, Yellamma/Renuka-Kakatiya Dynasty, Kridabhiramam, Subaltern Religion, Non-Brahmin Priesthood (Bavanilu), Blood Sacrifice, Disease and Protection Cults, Syncretism And Sanskritization-Orugallu.

Introduction

History tells us that the Andhra region was ruled by a number of dynasties – Mauryas, Satavahanas, Ikshvakas, Vishnukundins, Chalukyas of Badami, Kalyani and Vengi, Rastrakutas, Pallavas, Cholas, Kakatiyas, Gajapathis, Vijayanagara kings, and Asaf Jahis— since the post-Mahavira and Gautama Buddha period in the history of India. All this tells us that the history of Andhra dates back to the pre-Christian era.

Brief Survey of Political History

When examining the geographical distribution of mediaeval Andhra, it is observed that it is quite different from modern Andhra Pradesh, which was formed on the linguistic basis in 1952. It becomes very important to study the geographical regions existing in the period of study. Historians denote the regions, which are immutable and may cease to be meaningful in another period (1). For example Vengi was once a very prominent region comprising part of coastal Andhra is now not well-known. The regions are therefore, products of history and are always changing.

It is observed that the administrative units or political distribution of Andhra region is not clearly demarcated in medieval period as separate entity. In the medieval period, the administrative units are called nadus. Andhradesa was divided into several nadus such as Venginadu, Velanadu, and Sabinadu etc. (2). The Kakatiyas are one of the major dynasties that ruled over the mediaeval Andhra. They were feudatories of Eastern Chalukyas, but later shifted their allegiance to the western Chalukyas of Kalyani. The great kingdom of western Chalukyas which flourished over 150 years had declined about the middle of the twelfth century. Their feudatories, the Kakatiyas taken the advantages of master's weakness and asserted independence (3). The Kakatiyas established their power in Warangal by about 1000 CE and their rule ended in 1323 CE. The entire period of the Kakatiyas may be divided into two periods. The first period extended from 1000 to 1157 CE. During this period Kakatiyas established and consolidated their position in the Eastern Telangana region. The second period, which extended from 1158 to 1323 CE, saw their rise and downfall. The kakatiyas were out-and-out an indigenous power sprung from the Fourth caste.

The first of king of Kakatiya Beta I (1000-1030CE), who was subordinate to Kalyani Chalukyas ruled over Nethavadi and Koravi, both are situated in erstwhile Warangal District. Prataparudra I (1158-1195) was the first independent king of the dynasty. Ganapathi Deva (1199-1262) was the greatest ruler of the Kakatiya dynasty. Ganapathi Deva extended his empire not only through conquest but also through matrimonial alliance. Therefore, Ganapathi Deva ruled entire Andhradesa extending from the Ganjam district in the north to Conjeevaram in the south, embracing Telangana, Coastal Andhra and Rayalaseema. Ganapathi Deva shifted the capital from Hanmakonda to Orugallu (Warangal) and he developed it as a most beautiful city. Rudrama Devi ruled between 1262-1289. She successfully defended the kingdom against the Yadavas of Devagiri and the Pandyas and also she earned high praise from Venetian explorer Marco Polo. Prataparudra II (1289-1323) was the last ruler of Kakatiya dynasty. He was defeated by Ulugh Khan and taken captive and also sent him to Delhi. The Kakatiya empire was integrated in Delhi empire. The religion during 12th century to 14th century was predominantly Hinduism. There were two important religious sects prevalent in medieval Andhra. They were shaivism and

vaishnavism prevalent in Andhra. Even though they patronized Hinduism, the ruling class followed religious tolerance towards Jainism and Buddhism. Virasaiva movement was popular in Karnataka, also left its ripples upon Andhra. In Virasaivism, Shiva is being supreme, who is omnipotent of lord of universe. It opposed the Brahmanical rituals and brahmins as priestly class. Brahmins were replaced by Jangamas as priests. Virasaivism spread South India during 11th to 13th century. Mallikarjuna Panditharadya of Andhra was chief exponent of Virasaivism. Shiva was worshiped in the form of Bhairava, Mailara during the Kakatiya period. Srisailam, Tripurantakam, Umamaheswaram, Sangameswaram, Yelleswaram, Somashila, and Draksharamam were important Saiva centres during 12th century to 14th century. Hanmakonda, Orugallu, Srikurmam, Simhachalam, Bhadrachalam, Macherla, and Palnadu were important vaishnava kshetras during Kakatiyas.

Brahmins and a section of Vaishyas were monopolized educational knowledge and enjoyed social status, economic and political power throughout history. Brahmanical cultural practices were elite culture. The temples and maths(monasteries) were used to spread elite culture. The elite culture consists of rites, rituals, yagnas, penance, and classical dance called Marga. This culture was patronized by the ruling class. In contrast to literary groups, groups such as Sudras, Untouchables, Boyas, Pulindas and Chenchus etc who were majority belongs to non-literary groups denied access to theoretical education and marginalized in history. The non-literary groups depend much on the oral tradition to transmit their cultural forms. Apart from worshipping Shiva, the marginalize community also worshipped goddess Ekavira.

Worship of Ekavira

Vinukonda Vallabharaya has perhaps the first writer to produce a Telugu play, *Kridabhiramam*, which is a famous mediaeval one-act play that provides a vivid, realistic, and highly eroticised panorama of street life in the Kakatiya capital of Warangal. It is in the form of dialogue between a Brahmin playboy named Govinda Manchana Sharma and his merchant companion Tittibha Setti in search of courtesan lover Kama-manjari in the streets of Kakatiya's capital Warangal from morning to evening. *Kridabhiramam* contains significant historical records of regional deities and folk traditions, including an early mention of goddess Renuka Yellamma. On their way, Tittibha told Manchana, May these heroes bring our business to fulfilment. Let's go! In a few steps we will see the cement enclosure of Ekavira, its gate adorned with neem branches and wonderful garlands (4). After reaching the goddess Ekavira, Tattiba praised Ekavira and prostrated before the feet of Ekavira (5). She may have been a Saivite goddess. *Kridabhiramam* refers to the names of the Ekavira goddess along with Kakatamma (6). On the basis of the above description, it is a clear inference that the name of the goddess is Ekavira. She is also known by several names like, Renuka, Renuka Yellamma, Renuka Devi, Renuka Bhavani, Yellamma Jagadamba, Maremma, and Mariamman in South India. Renuka was also called Maharamma

because she was an inhabitant of the village named Mavurala in Adilabad District. She is a nude deity (7). At present she is called Yellammadevara in Rayalaseema and Telangana.

Worship of Ekavira in different parts of Andhra

The goddess Yellamma was famous in Warangal. One street is named after the goddess Yellamma and called Yellamma Bazaar. It seems to be the oldest. Is the nude idol found at Warangal is Yellamma? One nude Yellamma idol was also found in Alampur. It is popularly known as Dakhina Kashi. Yellamma was earlier called Jogulamba. On the basis of it, it is concluded that she might have been forcefully converted to Saivism from Jainism. The local people called the nude deity of the Braheshwara temple in Alampur as Yellamma and Renuka. By obeying his father's order, Parashurama cut off his mother's head; the body fell in Alampur itself, and the head flew up to and fell in Malawada (8).

Another name of Yellamma is Maavuraala Yellamma. The oldest temple of Yellamma was in Polasa, Karimnagar district. Still, people worship her in that area. The devotees also worship her in the name of Maavuraala Yellamma. According to folk, the idol of Yellamma was brought from a village named Maavuralla in the Adilabad District and consecrated in Polasa village in Karimnagar. Hence, the devotees called her Maavuralla Yellamma (9). The folk view was attested by Vallabharaya's *Kridabhiramam* by mentioning that Maavurala Yellamma was a famous goddess who was an inhabitant of Polasa (10). Koravi Goparaju was the poet of Rachakonda Padmanayakas, who was a feudal chief of Kakatiya, also mentioned in a series of goddess in his *Sinhasna Dvathrimika*. Among the one goddess worshipped by the folk was Ekavira (11). This point attests that the worship of Yellamma was also prevalent in the 14th century.

Different Versions of Origin of Ekavira

Regarding the origin of Ekavira, there are two best-known myths concerning the origin of the popular goddess Mariamma, or Ekavira in South India. In one version, a young Brahmin girl is courted by and eventually married to an untouchable, who is a disguised Brahman. On discovering the trick, the woman becomes furious and kills herself. She was transformed into a goddess, and in her divine form, she punishes the untouchable by burning him to ashes or otherwise humiliating him. Another version of Mariamma's origin identifies her with an extremely pious, pure wife who is married to a devout holy sage, Jamadagni. She is so pure that she can make jars out of loose sand and boiling water simply by placing a pot of water on her head. One day, she sees two *gandharvas* making love and feels envy. Thereupon, she loses her miraculous powers. Discovering this and suspecting her sexual disloyalty, her husband Jamadagni commands her son to kill his mother. The son obeys his father's order and decapitates his mother. Eventually she is restored to life, but in the process her head and body are transposed with those of untouchable women. Mariamma is understood to have a Brahman head and an

untouchable body, which is significant in terms of both her ambivalent nature and her role as a local deity exemplifying the social *status quo* in which Brahmins are at the head of the social system (12).

Referring to this story, White Head observes, "The story... describes the fusion of Aryan and Dravidian cults in the days when Aryans first found their way into South India. A Pariah body with a Brahmana head is an apt description of the cult of Siva, while a Pariah head with a Brahmana body might well describe some of the cult of the ancient Dravidian deities, modified by Brahmana ideas and influences (13).

Role of Bavanilu

The story of Yellamma, which is even today sung by Baindla (a sub-caste of scheduled caste) known as *Yellamma Katha* in some villages of the Rayalaseema and Palmur districts, using *Jamidika* (a musical instrument) continuously for two days. Even during the Kakatiya period, Bavanilu (a sub-caste of scheduled caste) sings *Yellamma katha*. The sound that *Jamidika* produces is like *Jukajum, Jum Jukajum, Jumman*. In another stanza also Vallabharaya gives the description of the songs of Parashurama stories sung by Bavanilu standing before Ekavira Mahadevi in the midst of sounds (13). The goddess Yellamma was famous in Orugallu (Warangal) and there is one street called Yellamma Bazar even today in Warangal. The local people said that the Yellamma Bazar was once inhabited by the goddess Yellamma; that's why they named it Yellamma Bazar (street).

Role of Ekavira in Protecting People

The relationship between local deities and their village is more complicated. This is made clear by the association of these goddesses with the causes of diseases and also with the protection of people from diseases, which are ambivalent in character. The local deities were closely associated with diseases, epidemics, disasters, sudden death, etc. To cool the wrath of the local deities, the people used to celebrate festivals. Such disasters are taken to represent either the presence of demons in the village or the anger of awakened goddesses, who are neglected by people for a long time. In order to appease her wrath, people used to celebrate festivals.

Festivals

During the festivals, villagers offered special worship to appease deities by sacrificing animals and offering (*naivedyam*) heaps of cooked rice mixed with turmeric powder in earthen pots. After some time the offered food was regarded as *prasadam* and was distributed among the people. The offered food, which is *Yengili* (first consumed by God and then left over for the devotees as *prasadam*) of the deity, was accepted by all devotees with pleasure. Generally, the acceptance of offered food by all devotees symbolises the superiority of deity over the people.

The festivals were associated with local deities like Ekavira and involved blood sacrifices. Priests in these festivals were generally non-Brahmins, like *Bavanilu*, in contrast to Brahmins,

who are priests of Brahminic gods. These festivals are associated with blood sacrifices. These blood sacrifices can also be understood from two points of view. At one level, sacrifices may be seen as a gift from the villagers, with which they hoped to appease the goddess so that she would withdraw her anger, which was expressed in the form of diseases. At the second level, the sacrifices may be understood as representing the defeat of invading demons.

Conclusion

Ekavira's cult during the Kakatiya era embodies a locally grounded yet regionally networked goddess tradition that negotiated power, purity, and protection beyond elite Brahmanical frameworks. Through origin myths that splice caste and bodily boundaries, non-Brahmin ritual leadership, and festival economies addressing epidemic threat, her worship articulated subaltern religiosity while interfacing with urban courts and literary testimony. The persistence of Yellamma toponyms and practices from Warangal to Alampur and Polasa underscores a historical continuum in which political change reframed—but did not erase—the social work of village goddesses.

References

1. Hanumantha Rao, B. S. L. (1983). *Andhrula charitra*. Guntur.
2. Satyanarayana, K. (1983). *A study of history and culture of Andhra* (Vol. 2). People's Publishing House.
3. Vallabharaya, V. (1988). *Kridabhiramam* (V. Prabhakara Sastry, Ed.). Manimanjari Prachuranalu.
4. Vallabharaya, V. (1988). *Kridabhiramam* (V. Prabhakara Sastry, Ed.). Manimanjari Prachuranalu.
5. Vallabharaya, V. (1988). *Kridabhiramam* (V. Prabhakara Sastry, Ed.). Manimanjari Prachuranalu.
6. Prathapa Reddy, S. (1992). *Andhrula sangika charitra*. Oriental Longman.
7. Prathapa Reddy, S. (1992). *Andhrula sangika charitra*. Oriental Longman.
8. Krishna Rao, T. (1989). *Folklore in Telugu classical literature (From the 11th century to the 16th century)*. Janapada Vignana Publications.
9. Vallabharaya, V. (1988). *Kridabhiramam* (V. Prabhakara Sastry, Ed.). Manimanjari Prachuranalu.
10. Koravi, G. (1982). *Simhasana Dvatrimika* (G. Ramakrishna Sharma, Ed.). Andhra Pradesh Sahitya Academy.
11. Kinsley, D. (1987). *Hindu goddesses*. Delhi.
12. Whitehead, H. (1976). *The village gods of South India*. Sumit Publications.
13. Vallabharaya, V. (1988). *Kridabhiramam* (V. Prabhakara Sastry, Ed.). Manimanjari Prachuranalu.

EXPLORING THE RECENT DEVELOPMENTS OF GREEN FINANCE AND SUSTAINABLE INVESTMENT IN INDIA: A STUDY

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Abstract

Green finance has now become an integral part of India's financial system, playing a crucial role in the process of funding sustainable economic growth along with fulfilling India's promise of net-zero carbon emissions by 2070. As the country is striving for quick industrialization and development of infrastructure, the need for financing has become much more intense when it comes to renewable energy, sustainable transport, climate-proof infrastructure, and clean technologies. Although there have been certain changes in policies and investment from the investors' side, the sustainable finance ecosystem of the country is yet to develop, facing challenges such as regulatory problems, lack of information, and market inefficiencies. This review paper evaluates the history, regulatory system, market trends, and future scope of green finance and sustainable investments in India. In this study, analysis of various green bonds, Sovereign Green Bonds, ESG investments, sustainable mutual funds, and climate finance products are carried out using the secondary data collected from research journals, policies and other academic resources. The findings show that sustainable concerns are increasingly being taken into account while making investment decisions and carrying out capital market operations. Though there are a few issues, such as greenwashing problems, lack of a common green taxonomy, high cost of financing, and lack of climate risk disclosures, limiting the development of the market. These areas can be improved through enhanced regulatory oversight, adoption of a blended finance model, better sustainability reporting practices, and climate risk assessment approaches to enable the development of an efficient and scalable sustainable finance ecosystem in India. This study provides an overview of the history, regulation, trends, and development opportunities for green finance and sustainable investment in India. Emerging trends in green bonds, sovereign green bonds, ESG investments, sustainable mutual funds, and climate-related finance products have been identified using secondary data analysis. Findings indicate that there is a slow incorporation of sustainability in the decision-making and operations of the capital market. There are different challenges such as the greenwashing problem, lack of

green taxonomy, high cost of financing, and inadequate climate risk disclosure that constrain the development of the market.

Keywords: Green Finance, Sustainable Investment, ESG Investing, Green Bonds, Climate Finance, Financial Markets.

Introduction

India is said to be one of the fastest-growing economies of the world. It is also predicted that India would continue to be an important player in terms of economic growth for the coming decades. For sustaining this kind of growth rate, it is essential to make serious investments in infrastructure development, industrialization, energy security, and technology. Meanwhile, there are climate risks that have started causing economic issues too, which makes the question of sustainability of financial markets important. The country is aiming at meeting its objective of attaining a net-zero emissions target in the year 2070, and 50% of the total electricity installed capacity must come from non-fossil sources by 2030. This objective will require massive financing. As per various estimates given by the Climate Policy Initiative (CPI) and the Council on Energy, Environment, and Water (CREW), India will need a few trillion dollars of funding in the coming years. The scale of such an investment need is, therefore, a great challenge from a financial point of view. Taking into account the lack of funds on the one hand and other developmental needs on the other, it is not possible to raise the capital needed for the purpose through public spending. Therefore, it is important to involve the private capital markets, institutional investors, commercial banks, development finance institutions, and global financial institutions in the process of funding green growth.

The Indian financial sector has seen several significant milestones over the past few years, such as the expansion of green bond markets, the issuance of Sovereign Green Bonds (Serbs), the adoption of an ESG-based investing approach, and the development of sustainability-based disclosure frameworks by regulatory bodies. Additionally, financial regulators like the RBI and SEBI have taken several important steps to introduce climate-related factors into financial regulation and risk management, as well as financial reporting systems.

Therefore, the current review paper considers the dynamics of green finance and sustainable investment in India through the analysis of secondary data and recent literatures. It addresses the financial aspects of sustainability by discussing the changes that occur in regulatory frameworks, capital markets, investments, and financing approaches. Meanwhile, the main challenges, such as greenwashing, financing barriers, lack of disclosure, and fragmented regulations, are evaluated. Apart from several future directions that may facilitate the further development of a sustainable finance ecosystem in India are identified.

Financial Regulatory Architecture and Sustainable Finance Policies

The development of green finance in India has largely been influenced by regulatory agencies aiming to create harmony between financial markets and sustainable goals (Shah *et al.*, 2023). Additionally, environmental considerations, regulators also have intervened with the intention of improving financial stability, increasing transparency, and channelling funds towards sustainable development initiatives.

Strengthening Green Financial Stability through RBI

The RBI has gradually acknowledged the impact of climate change as one of the factors causing systemic financial risk. Conventional financial supervisory activities used to be confined to credit risk, market risk, and operational risk, while climate change has become another issue that impacts the stability of financial organizations (Joshi, 2025). The physical risks emanating from extreme weather conditions and the transition risks connected with the shift towards a low-carbon economy can have a substantial effect on the quality of assets and loans.

For solving these issues, some schemes have been introduced by RBI in terms of incorporating climate considerations into the regulations of the financial sector. Participation of RBI in NGFS shows that there is an intention on behalf of India to ensure that its financial system complies with international standards of sustainability (Sherry & Rajput, 2025). Also, the introduction of the Green Deposit Scheme gives an opportunity to banks to receive funds that will be used for environmentally sustainable projects.

Furthermore, RBI asks banks to report and do stress tests under different scenarios so that banks may discover weaknesses in the banking sector (Ahuja, 2019). Banks consider environmental aspects when they are investing in some projects. Due to such initiatives, the banking sector becomes sustainable, and thus, the sustainable development of the economy is ensured.

SEBI's Sustainable Finance Disclosure Framework

The Securities and Exchange Board of India (SEBI) has been a catalyst in improving sustainability disclosures in the capital markets. In the transition from regular financial reporting to the new system of business responsibility and sustainability reporting (BRSR), they have made a great leap forward in terms of transparency on the part of companies (Debnath & Kanoo, 2022). With the use of BRSR, companies are expected to provide ESG performance metrics for the benefit of investors in their risk assessment.

The development of the concept of BRSR Core has added another level to the disclosure obligations, with assurance and supply chain sustainability metrics being the key features for large publicly traded companies (Kajal & Bansal, 2025). Higher standards of disclosure contribute to the reduction of information asymmetry between the corporation and its investors.

In terms of finance, enhanced ESG disclosures can lead to a reduction in the cost of capital as it leads to the lowering of uncertainty as well as an increase in the confidence levels of the investors. As such, there is more incorporation of sustainability considerations in the decision-making process of the institutional investors (Ali *et al.*, 2025).

Government-Led Green Financing Mechanisms

Government intervention is still important for channelling finances towards India's sustainability transition. One of the innovations in this regard is that of sovereign green bonds (Yadav *et al.*, 2024). Such bonds help the government to borrow money for purposes of environment-friendly initiatives such as renewable energy generation, sustainable transport, and climate change adaptations.

There are many benefits associated with sovereign green bonds, as it helps to bring more financiers into the picture who are concerned with sustainability. It also helps build credibility regarding India's environmental goals. Furthermore, it sets benchmark pricing for the issuance of corporate green bonds.

Public finance also acts as a catalyst in crowding in private finance. The involvement of the government in financing helps reduce risk perceptions surrounding green infrastructure initiatives, which, in turn, makes the commercial banks and other private entities invest in areas where financing would be difficult otherwise (Sarangi, 2018). Thus, public financing models also help in developing markets.

Sustainable Investment Growth and Market Dynamics

Market development for sustainable finance in India is an indicator that investors are increasingly concerned about climate opportunities and threats. Innovations in financial services have opened up new ways of raising money in support of a low-carbon economy.

Green Bond Market Development and Capital Mobilization

Over the last few years, there has been significant growth in the Indian green bond market (Abhilash *et al.*, 2023). Sovereign issuers as well as companies have increasingly employed green bonds as a way of financing renewable energy, sustainable infrastructure, and energy efficiency projects. Growth in the Indian green bond market is an indication of increasing demand from investors for environmentally friendly investment products (Abhilash *et al.*, 2023).

The issuance of green bonds helps the issuer to get diversification in financing options, as well as improve the company's image in terms of sustainability. There are numerous Indian companies that have managed to attract domestic as well as foreign investments by issuing green bonds.

In regard to the performance of the green bonds, an essential point to consider is the issue of the Lower interest on borrowing might make projects feasible and stimulate investments in energy

infrastructure. Funds from green bond issuance have recently been directed toward solar energy projects, wind energy projects, clean transportation projects, and energy-efficient infrastructure projects (Gupta *et al.*, 2024).

ESG-Based Investments and Capital Market Dynamics

ESG investing has made much progress in India owing to the increasing awareness among the investors about the importance of sustainability for their financial well-being. Asset management firms have introduced ESG-themed mutual funds, which will incorporate environmental, social, and governance aspects in their investments.

The popularity of ESG-oriented funds has been fuelled by the growing awareness among the investors, regulations, and trends across the globe towards responsible investment practices. Sustainable mutual funds have witnessed much investment from both individual and institutional investors due to their sustainable nature (Agarwal & Rastogi, 2026).

ESG integration implies several financial benefits to the organization. Companies with sustainability practices feature excellent risk management, efficient operations, and effective governance (Thirumalai, 2022). These factors may prove useful in achieving better financial performance and lower volatility. The issue of whether ESG leads to outperformance of the investment portfolio is rather ambiguous, as there are studies both confirming and refuting this claim, but the majority support the idea that ESG integration leads to higher diversification of the portfolio and its resilience during market uncertainty periods.

The increasing popularity of ESG products is another sign of changes in investors' priorities as they assess their investment performance not only from the financial but also sustainability standpoint. This trend will likely continue due to the increase in climate-related risks.

Blended Finance Mechanisms and Capital Mobilization

Financing the huge climate finance needs of India will require a novel financing approach that would be able to leverage private capital (Arora & Pujar, 2024). One of the mechanisms that have proved quite effective in addressing the problem mentioned above is the blended finance model, which includes concessional finance by public sources as well as commercial financing.

It is important for there to be involvement of international financial institutions, development finance institutions, and international climate finance organizations in providing catalytic financing (Chaudhury, 2020). This reduces risks, and the involvement increases the attractiveness of the financing through guarantees and financing at concessional rates with first loss coverage. This creates incentives for commercial financiers to invest in the projects.

The contribution of public-private partnerships (PPPs) towards sustainable infrastructure financing is another dimension because it helps blend the advantages of both the public and

private sectors in financing infrastructure projects. The concept of PPPs has proved useful in areas like renewable energy, transport infrastructure, and urban infrastructure, among others. Blended finance and PPPs complement the whole framework of sustainable finance in India (Bahl *et al.*, 2026).

Financial Constraints and Structural Challenges in Green Finance

There have been many successes, several structural constraints remain that limit the growth of the green finance markets in India. Lack of Green Taxonomy Framework and Investment Uncertainty. One of the important challenges facing the green finance market in India is the lack of a comprehensive framework for green taxonomy (Seth & Kaushik, 2025). Without an understanding of what qualifies as a green activity, uncertainty prevails when classifying the project or making decisions on investments.

In addition to creating market fragmentation, the lack of a common taxonomy increases the cost of doing business by preventing consistency and comparability. This is because different financial institutions may have varied frameworks for assessing the sustainability of their investments (Ziolo *et al.*, 2019). Moreover, foreign investors tend to align themselves with internationally accepted sustainability principles. Therefore, the lack of a common taxonomy could hinder foreign investments in the market. A proper taxonomy framework can increase transparency and efficiency of capital flow and create credible green financial instruments.

Greenwashing Challenges in Sustainable Financial Markets

The problem of greenwashing persists in the sustainable finance market space. Companies can inflate the environmental impact of their operations, causing misinformation in the market (Şenyapar, 2024). Greenwashing leads to the lack of credibility and trust in the sustainable investments available to the market. Information asymmetry caused by the inconsistent sustainability reporting makes the process of evaluating the environmental performance of the company more complicated (Al Amosh, 2025).

Greenwashing may cause the distorted pricing of assets. It is possible that an investor may invest money into projects that do not bring the expected environmental benefits, causing higher risks for the investment portfolio.

Challenges of Capital Access and Maturity Mismatch

The high cost of funding still persists as one of the major obstacles in making investments in the area of sustainability in India (Wasan, 2021). Though the sustainability-oriented investments have both economic and environmental advantages in the long run, these investments need large sums of money to be made. The sustainability initiatives might fail because of the inability to get reasonable financing.

Inefficient financing structures of India hinder the process of obtaining appropriate funding. Commercial banks are mostly financed through short-term deposits, whereas green infrastructure requires a long-term financing horizon (Dhruba, 2018). Therefore, such a disparity prevents banks from giving long-term loans, especially those that are viewed as risky. Moreover, small and medium-sized enterprises (SMEs) have smaller opportunities for borrowing since they usually lack the required collateral and the needed credit histories.

Conclusion

The findings of this study highlight the rising significance of green finance and sustainable investing to facilitate the shift of India into a low-carbon and resilient economy. In last few years, India has accomplished quite a bit of progress in building an institutional arrangement around sustainable finance via different regulatory measures, green financial instruments, and enhanced sustainability reporting. Initiatives made by RBI, SEBI, and the Government of India have resulted in establishing sustainable finance in the country. The use of Sustainable Green Bonds, BRSR, and ESG-based investments has enabled the generation of capital for environmentally sustainable projects and increased the awareness of climate risks among investors. Though the review still brings to light various structural and financial barriers that hinder the development of green finance markets in India. Lack of a complete green taxonomy in India makes the identification of sustainable activities difficult and hampers market standardization. Apart from the high cost of financing, information asymmetry, greenwashing fears, and lack of proper risk sharing arrangements make investors hesitant to allocate their money towards sustainable infrastructure. Therefore, the present investment in the form of green finance is far less than what is required for India to meet its environmental targets and sustainable development goals.

In future, some of the strategies that must be implemented to foster India's sustainable finance environment include the following. policymakers must focus on developing a green taxonomy for India that is consistent with international sustainable finance standards while addressing India's development needs as well. This will improve the transparency, comparability, and credibility of the various green finance instruments and services. Also, increased attention must be given to improving the blended finance structure through guarantee schemes by the government, first loss capital, and green credit enhancement programs.

Furthermore, the establishment of sustainable capital markets should be facilitated through the issuance of green bonds, sustainability-linked bonds, transition bonds, and green securitization. The participation of pension funds, insurance firms, and other institutional investors in investments will further help in capital funding of sustainable infrastructure investments. Also,

the use of technologies such as artificial intelligence, machine learning, and fintech platforms should be employed in dealing with ESG data and climate risk assessments. This will increase the integrity of the market and ensure that there is no greenwashing.

References

1. Abhilash, Shenoy, S. S., Shetty, D. K., Lobo, L. S., & N, S. K. (2023). Green bond as an innovative financial instrument in the Indian financial market: Insights from systematic literature review approach. *SAGE Open*, 13(2), 21582440231178783.
2. Agarwal, B., & Rastogi, S. (2026). Sustainable investing and mutual fund performance: Evidence from the Indian market. *Journal of Global Responsibility*, 1–19.
3. Ahuja, B. R. (2019). *A macroeconomic stress testing framework for credit risk in banking: A case of India* (Doctoral dissertation, Alliance University, India).
4. Al Amosh, H. (2025). Exploring the influence of accounting reporting complexity on ESG disclosure. *Corporate Social Responsibility and Environmental Management*, 32(5), 5760–5778.
5. Ali, A., Imran, M., & Farooqi, A. (2025). Investor behaviour and ESG integration: A study of portfolio management practices in India. *International Journal for Multidisciplinary Research*, 7(5).
6. Anjanappa, J. (2024). *The role of concessional finance in promoting sustainable investments in India*. SSRN. <https://doi.org/10.2139/ssrn.5038484> (if DOI available)
7. Arora, G., & Pujar, S. (2024). *Financial and policy catalysts for climate tech expansion in India: Insights from the “Green Innovation and Investment Dialogue.”*
8. Bahl, K., Pandey, A. K., Valecha, S., Sharma, P. B., & Sharma, R. (2026). Learning from the past, planning for tomorrow: Evidence-based insights into infrastructure finance and sustainable governance in emerging economies. In *Infrastructure finance and sustainable governance* (pp. 339–361). Springer Nature Switzerland.
9. Chaudhury, A. (2020). Role of intermediaries in shaping climate finance in developing countries—Lessons from the Green Climate Fund. *Sustainability*, 12(14), 5507.
10. Debnath, P., & Kanoo, R. (2022). Business responsibility and sustainability reporting: A way forward for Indian corporate disclosure. *Journal of Commerce and Trade*, 17(2), 23–31.
11. Dhruba, P. (2018). *Managing credit risk and improving access to finance in green energy projects* (ADB Working Paper No. 855).
12. Gupta, P., Aggarwal, M., & Malhotra, S. (2024). Bridging the green finance gap in India: The role of green bonds in accelerating sustainable development. *Foundations of*, 76.

13. Joshi, V. C. (2025). *Changing dimensions of financial services and banking regulation*. Springer.
14. Kajal, A., & Bansal, S. (2025). Analysing impact of corporate attributes on sustainability disclosures through India's new BRSR framework. *International Journal of Law and Management*, 67(2), 282–298.
15. Naffa, H., & Fain, M. (2020). Performance measurement of ESG-themed megatrend investments in global equity markets using pure factor portfolios methodology. *PLOS ONE*, 15(12), e0244225.
16. Sarangi, G. K. (2018). *Green energy finance in India: Challenges and solutions* (ADB Working Paper No. 863).
17. Şenyapar, H. N. D. (2024). Unveiling greenwashing strategies: A comprehensive analysis of impacts on consumer trust and environmental sustainability. *Journal of Energy Systems*, 8(3), 164–181.
18. Seth, S., & Kaushik, H. (2025). Examining interactions among challenges of green financing in India. *Ecological Civilization*, 2(4), 10012.
19. Shah, S. B., Jirakiattikul, S., Techato, K., & Mudbhari, B. K. (2023). A systematic review on nexus between green finance and climate change: Evidence from China and India. *International Journal of Energy Economics and Policy*, 13(4), 599–613.
20. Sherry, A., & Rajput, N. (2025). *International climate protocols and the Indian banking sector: A systematic review of adoption*.
21. Thirumalai, N. K. (2022). *A study on the awareness level of investors in ESG investing and the impact of non-financial factors in long-term performance of organisations in Indian market* (Doctoral dissertation, National College of Ireland, Dublin).
22. Wasan, P., Kumar, A., & Luthra, S. (2021). Green finance barriers and solution strategies for emerging economies: The case of India. *IEEE Transactions on Engineering Management*, 71, 414–425.
23. Yadav, A., Manda, V. K., Sangwan, V., & Vambol, S. (2024). Sovereign green bonds as an unconventional tool to address climate change. *Ecological Questions*, 35(3), 1–26.
24. Ziolo, M., Filipiak, B. Z., Bąk, I., & Cheba, K. (2019). How to design more sustainable financial systems: The roles of environmental, social, and governance factors in the decision-making process. *Sustainability*, 11(20), 5604.

MAHATMA JYOTIRAO PHULE'S CONTRIBUTIONS TO THE SOCIAL REFORM MOVEMENT IN MAHARASHTRA

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Introduction

Mahatma Jyotirao Govindrao Phule (1827–1890) stands as one of the most visionary and courageous figures in the history of social reform in Maharashtra and India. A pioneering thinker, educator, and activist, Phule dedicated his life to combating social inequality, caste discrimination, superstition, and the oppression of women. His efforts extended far beyond local boundaries, laying the ideological foundation for broader social justice movements across India. Phule's work emphasized education as the primary tool for emancipation, equality as a fundamental right, and rational inquiry as the antidote to blind tradition. This chapter provides a comprehensive overview of his multifaceted contributions to Maharashtra's social reform movement.

1. Pioneering Women's Education and Empowerment

One of Phule's most revolutionary achievements was his unwavering commitment to women's education and empowerment at a time when society vehemently opposed educating girls, especially from lower castes.

- **First School for Girls:** In 1848, Phule established India's first school for girls in Pune. Facing fierce resistance from upper-caste orthodoxy, he persisted. He educated his wife, Savitribai Phule, and trained her as a teacher. Together, they ran the school, making it a beacon of progress.
- **Savitribai Phule's Role:** Savitribai became a formidable educator and social activist in her own right. She endured social ostracism, verbal abuse, and physical threats while teaching girls and marginalized children.
- **Support for Widows and Prevention of Infanticide:** Phule advocated widow remarriage and established a shelter for widows in 1863. He also founded a "Home for the Prevention of Infanticide" to protect unwed mothers and their children, providing refuge and dignity.

- **Broader Impact:** Through education and self-reliance initiatives, Phule sought to elevate women's social status and dismantle patriarchal and religious constraints that kept them subjugated.

These initiatives marked a radical break from tradition and set a precedent for subsequent women's rights movements in India.

2. Crusade Against the Caste System

Phule was a fierce critic of the caste hierarchy, particularly Brahminical dominance, which he viewed as a system of exploitation that denied dignity and opportunities to Shudras and Atishudras (Dalits).

- **Challenging Caste Oppression:** He vocally opposed the exclusion of lower castes from education and social rights.
- **“Gulamgiri” (Slavery):** Published in 1873, this seminal book offered a scathing critique of caste-based slavery and Brahminical supremacy. It awakened Shudras and Atishudras to their historical subjugation and inspired self-respect.
- **Schools for Backward Classes:** In 1851, Phule opened schools for children from marginalized communities, promoting education without caste or religious discrimination. These institutions played a crucial role in integrating Dalits into mainstream learning.

Phule's writings and schools empowered the oppressed to question and resist systemic injustice.

3. Founding of the Satyashodhak Samaj (1873)

In 1873, Phule established the Satyashodhak Samaj (Society of Truth-Seekers), a landmark organization dedicated to social equality, rational thought, and the eradication of superstition.

- **Core Objectives:** Promote equality, rationalism, and opposition to blind faith and ritualism.
- **Religious Reform:** The Samaj encouraged simple, inexpensive marriage ceremonies free from costly Brahminical rituals. It challenged priestly dominance and promoted direct, accessible religious practices.
- **Mass Awakening:** Through public meetings, lectures, and literature distribution, the organization spread ideas of education, equality, and human rights among the Bahujan (masses).

The Satyashodhak Samaj became a powerful platform for unifying and mobilizing the common people toward social transformation.

4. Education as the Engine of Social Change

Phule firmly believed that education was the most potent weapon against ignorance and exploitation. He famously articulated: “Vidya vina mati geli, mati vina niti geli” (Without education, wisdom is lost; without wisdom, morality is lost).

- He established multiple schools for backward classes and Dalits, fostering self-reliance.
- Through his writings and speeches, he instilled values of learning and equality among the masses.
- His book “Shatapatre” (or “Shetkaryacha Asud” – The Farmer’s Whip) highlighted the exploitation of peasants and laborers, urging education as a path to economic and social empowerment.

5. Battle Against Superstition and Ritualism

Phule relentlessly attacked religious superstitions, meaningless rituals, and priestly exploitation.

- He promoted scientific temper and rational thinking.
- The Satyashodhak Samaj offered alternative, simplified religious practices that liberated ordinary people from exploitative customs.
- His efforts helped shift society toward a more enlightened, reason-based worldview.

6. Empowerment of Farmers and Laborers

Phule was deeply concerned with the economic exploitation of peasants and workers by moneylenders, landlords, and the caste system.

- In “Shatkaryacha Asud”, he exposed the plight of farmers and called for their organization and awareness.
- He encouraged collective action and economic self-reliance through education and unity.

7. Lasting Impact and Legacy

Phule’s contributions had profound and enduring effects:

- Social Awakening: His work instilled pride and confidence in Maharashtra’s Bahujan communities.
- Women’s Education: It paved the way for future reformers.
- Dalit Movement: Phule’s ideas directly inspired Dr. B.R. Ambedkar and the modern Dalit movement.
- Modern Maharashtra: His vision helped shape progressive social and educational policies, influencing concepts of social justice, reservations, and equality in independent India.

8. Relevance in Contemporary Times

Phule's struggle against casteism, gender discrimination, and inequality remains highly relevant today. His emphasis on education, rationalism, and social justice resonates in ongoing debates around affirmative action, women's rights, and inclusive development. The principles of the Satyashodhak Samaj continue to inspire movements for a scientific, equitable, and progressive society.

Conclusion

Mahatma Jyotirao Phule's contributions to the social reform movement represent a monumental chapter in India's quest for equality and justice. Through education, organization, critique of oppressive structures, and visionary institution-building, he sowed the seeds of a new, egalitarian social order. His legacy as the "Father of Social Revolution" in Maharashtra endures because he not only diagnosed the ills of society but also provided practical remedies rooted in compassion, reason, and courage. Phule's life and work remind us that true progress demands relentless questioning of the status quo and unwavering commitment to the upliftment of the marginalized. He remains an eternal source of inspiration for all who strive for a just and humane world.

References

1. Britannica. (n.d.). *Jyotirao Phule: Biography*. *Encyclopaedia Britannica*.
<https://www.britannica.com>
2. Ghorpade, A. K. (1953). *Mahatma Phule: Charitra va kriya* [Life and work].
3. Keer, D. (1974). *Mahatma Jyotibha Phule: Father of our social revolution*. Popular Prakashan. (Original work published 1974)
4. Patil, P. S. (1927). *Mahatma Jyotirao Phule yanche charitra*.
5. Phule, J. (1855). *Trutiya Ratna*.
6. Phule, J. (1869). *Brahmananche Kasab*.
7. Phule, J. (1873). *Gulamgiri* [Slavery].
8. Phule, J. (1883). *Shetkaryacha Asud* [The cultivator's whipcord].
9. Phule, J. (1891). *Sarvajanik Satyadharma Pustak*.
10. Wikipedia contributors. (n.d.). *Jyotirao Phule*. In *Wikipedia, The Free Encyclopedia*.
https://en.wikipedia.org/wiki/Jyotirao_Phule

THE ROLE OF ARTIFICIAL INTELLIGENCE IN MODERN BUSINESS DECISION MAKING

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Abstract

Artificial Intelligence (AI) has become the phenomenon of transforming technology that changes the manner in which organisations interpret information and make strategic choices. The business environments in the modern world are highly dynamic, data-intensive and in many cases the old methods of decision making cannot be used. Machine learning, predictive analytics, and natural language processing are AI technologies that allow organisations to process large amounts of data and determine patterns and provide actionable insights to support managerial decision-making. This paper examines how AI plays a part in decision making in the contemporary business world, concentrating on its significance in terms of strategic planning, business effectiveness, and competitiveness. The study also analyses the role of AI in improving the accuracy of the forecasting process, risk management, and customer insights coupled with the concomitant emergence of ethical, data privacy, and bias in algorithms. The paper emphasises the changing role of human judgement in decision systems that are aided by AI by evaluating the latest literature and interpreting the existing business trends. The evidence indicates that the affordability of AI to organisations that incorporate it strategically into decision-making frameworks may enhance responsiveness, innovation and performance. Nevertheless, to be implemented successfully, it must be governed well, employ skilled personnel and ethical to achieve responsible use of AI technologies.

Keywords: Artificial Intelligence, Business Decision Making, Machine Learning, Predictive Analytics, Strategic Management, Data-Driven Decisions.

1. Introduction

The swift development of Artificial Intelligence has become one of the most powerful technologies that impact the contemporary organisational management. Smart systems are becoming essential in businesses to provide solutions to managers in analysing large volumes of data and also in identifying trends as well as support managerial decision making. AI is the name of the computer systems that can carry out the functions that are traditionally the prerogative of

human intelligence, i. e., learning, reasoning, and problem solving (Saha *et al.*, 2023). The growing access to online information and the growth in computing capabilities have further increased the use of AI in most industries such as finance, marketing, medicine, and supply chain management. In modern organisations, decision making is not just made on the basis of mere intuition by managers or little information. Artificial intelligence-driven analytical systems allow managers to process and analyse complex data in real-time and make meaningful insights, which can be used to plan strategies and make decisions about operations. It has been shown that AI technologies considerably enhance the accuracy and efficiency of decision-making because they decrease human mistakes and allow predictive analysis (Fayaz *et al.*, 2024). Companies that consider AI in their decision-making processes tend to have an enhanced productivity, cost efficiency and competitive edge. The other development of significance is the merger of AI and big data analytics. Digital platforms, sensors, and dealings with customers produce vast amounts of formal and informal data that is generated by modern enterprises. AI applications allow converting this uncooked data into useful knowledge to facilitate evidence-based decision-making. Machine learning algorithms can predict the market trends, consumer behaviour, and also optimise their allocation of resources, which improves the level of strategic decision-making (Sultana, 2024). Nevertheless, regardless of the benefits, the use of AI also concerns transparency, ethical concerns, and excessive dependence on the automated system. Managers should, therefore, strike a balance between technology and human judgement in order to make responsible decisions. The increased significance of AI in business spheres is the reason why it is necessary to investigate the impact of the technologies on the managerial decision-making process and organisational performance.

2. Review of Literature

The past years have seen the rise of severe scholarly interest in the integration of artificial intelligence into business decision-making. A number of researches have been conducted regarding the importance of AI in enhancing managerial effectiveness and strategic planning.

Fayaz *et al.* (2024) investigated the influence of artificial intelligence on strategic decisions made in companies. Their study established that AI systems contribute substantially to the capacity of firms to process big datasets and facilitate long-term strategic plans. According to the authors, AI-driven analytics can enhance the precision of the decisions made by managers and allow the organization to adapt to the changes that may occur in the market better.

On the same note, Sultana (2024) has provided a systematic review on AI applications in decision-making using over a hundred articles. The study has pointed out that AI technologies, including machine learning, natural language processing, and predictive analytics, can help

organizations to make timely and informed decisions. Another point that the study highlighted was the accuracy of decisions made with the help of AI, whereas such issues as privacy of personal data or biases in the algorithm should be addressed carefully.

In a study by Khan (2025), the author applied AI to the business decision processes in different functional areas, such as marketing, finance, human resources, and many others. The results showed that AI applications offer useful data regarding risk evaluation, client behaviour, and financial prediction. The research has concluded that companies that implement AI technologies have a higher level of operational efficiency and competitiveness.

Another example of the significance of AI in enhancing the quality of decisions was brought up by Srivastva (2024), which is associated with predictive analytics and automation. The study further indicates that AI technologies can help an organization to analyse complex data and draw patterns that could not be seen amid the conventional data analysis tools.

A more recent study has also been conducted on the human-AI system of collaboration. Researchers point out that AI ought to be regarded as a decision support tool as opposed to the role of the human managers. Human-AI partnership enables organizations to integrate computational intelligence with management experience, and, thus, enhance the quality of the decision-making process as a whole. All in all, the current body of knowledge shows that AI is very important in revolutionizing the conventional managerial decision-making processes. Nonetheless, researchers also accentuate the importance of responsible adoption strategies that will cover ethical, technological, and organizational issues.

3. Artificial Intelligence and Intelligent Decision Making

The application of data-driven decision making has taken an imperative place in the modern business management. With the help of AI technologies, it is now possible to handle large volumes of data collected by organisations through the digital platform, communication, and systems of operations. The machine learning algorithms and advanced analytics can assist businesses to identify trends, forecast them, and generate inferences that can be utilised to make managerial decisions. The analytics tools adopted through the use of AI allow organisations to handle raw data and transform it into useful information that support strategic objectives and efficiency at work.

4. AI application in Business Decision Making.

Most business functions have been using artificial intelligence in the decision-making process.

- **Marketing:** The behaviour of the consumers is analysed using AI and the marketing campaigns are customised, and the market demand is predicted. The predictive analytics

tools help the organisations to know what the customers like and how to optimise the marketing process.

- **Finance** AI solutions are used in financial forecasting, fraud detection and investment analysis. Intelligent algorithms are used to analyse financial data in assisting in the accurate risk assessment and decision making.
- **Supply Chain Management:** AI increases the effectiveness of supply chains by predicting demand variations, automating stocks and strengthening the logistic schedule.
- **Human Resource:** The AI devices facilitate the recruitment of employees, the analysis of their performance, and the planning of the workforce. The intelligent systems will help organisations to narrow down the appropriate candidates and also to manage the human capital more efficiently.

5. The benefits of AI in Managerial Decision Making

AI application has several advantages to the modern organisations. Firstly, AI will enhance the quality of decisions by being very accurate in the analysis of big data. Second, it improves the rate of decision making by automating more complex analytical processes. Third, AI encourages predictive analysis and thus enables organisations to view the market trends and potential risks. Besides, it assists AI technologies in reducing costs of operation through automation of the repetitive operations functions and management of resources.

6. Both issues and Moral Dilemmas

Despite the benefits of using AI in making business decisions, there are certain challenges that are related to it. One of the problems of concern is algorithms bias because it may lead to unfair or discriminative outcomes. The privacy and the security of the information are also significant because the AI systems utilise large volumes of data that may contain sensitive data. In addition, the workers who fear losing their jobs due to automation can also direct opposition to the companies. Reasonable governance structures and codes of conduct are therefore required to have a responsible adoption of AI.

7. The use of Artificial Intelligence in Business Decision Making

The future of business decisions is expected to be determined by the advanced AI technologies that include deep learning, autonomous systems, and generative AI. Hopefully, organisations will be more likely to adopt intelligent decision support system that incorporates real-time analytics as well as predictive modelling. The integration of AI and new technologies, such as blockchain and Internet of Things (IoT), it may become even more productive in terms of business intelligence and the decision-making process. The interaction between the machine

intelligence and the professional knowledge will become more meaningful since AI is developing.

Conclusion

Artificial intelligence is revolutionising organisational decisions regarding strategies and operations. With the help of sophisticated analytics and machine learning algorithms, companies can analyse sophisticated data, predict trends, and enhance the accuracy of decisions. Although AI has a great deal of benefits in the aspects of efficiency and competitiveness, organisations have to consider ethical, technological and organisational issues related to the use of AI. The achievement of AI adoption has to be a compromise that integrates both technological advancement and human knowledge and morality. The future of management in organisations will be vital as organisations will operate in the more complicated environments that will be supported by AI-assisted decision-making.

References

1. Fayaz, M., Amin, M., & Iqbal, M. (2024). Artificial intelligence in decision-making: A descriptive analysis of its impact on strategic planning. *Journal of Business and Management Research*, 3(2), 222–235.
2. Khan, A. (2025). The role of artificial intelligence in business decision-making. *Journal of Management and Social Sciences Review*, 3(1), 1–10.
3. Saha, G. C., Menon, R., Paulin, M. S., Yerasuri, S., Saha, H., & Dongol, P. (2023). The impact of artificial intelligence on business strategy and decision-making processes. *European Economic Letters*, 13(3), 926–934.
4. Srivastva, R. K. (2024). The role of artificial intelligence in enhancing business decision-making. *International Journal of Advanced Research and Multidisciplinary Trends*.
5. Sultana, R. (2024). Artificial intelligence for decision making in the era of big data evolution. *Journal of Business Intelligence and Management Information Systems Research*, 1(1), 17–40.
6. Arora, P., & Das, J. (2025). The role of artificial intelligence in strategic business decision making. *Journal of Scientific Research and Technology*, 3(5), 21–27.

DIGITAL DISSEMINATION AND CLIMATE-RESILIENT EXTENSION FRAMEWORKS: SHIFTING PARADIGMS FOR SUSTAINABLE AGRICULTURE

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Abstract

Modern agriculture stands at the crossroads of severe climatic vulnerability and rapid technological evolution. Traditional top-down agricultural extension frameworks often fall short of delivering real-time, localized adaptive strategies necessary to combat unpredictable macro-weather patterns like El Niño. This chapter conceptualizes a synthesized model that bridges Information and Communication Technology (ICT) with climate-resilient extension methodologies. By analyzing empirical field operations, mobile advisory networks, and institutional frameworks, this study highlights how digital innovations—ranging from localized phone-in live streams to automated agricultural data platforms—accelerate the adoption of sustainable farming practices. Ultimately, the integration of public-private-partnership (PPP) frameworks and digital dissemination channels serves as a structural blueprint for upgrading rural tech-transfer mechanisms.

Keywords: Agricultural Extension, ICT, Climate Resilience, El Niño Mitigation, Sustainable Agriculture, Public-Private Partnerships.

1. Introduction

Agricultural extension serves as the structural conduit between research laboratories and farmers' fields. Historically, extension systems relied heavily on physical contact methods, group meetings, and seasonal demonstrations. While these frameworks built strong community foundations, their ability to scale rapidly during climate emergencies is inherently limited. The physical linear model of technology transfer lacks the speed required to address sudden environmental shifts. As climate change accelerates, triggering intense El Niño cycles, localized droughts, and unpredictable monsoon delays, the demand for dynamic information has risen exponentially. Sustainable agriculture can no longer treat technology transfer as a passive seasonal event; it must become a continuous, data-driven, and highly adaptive feedback loop. The transformation from broad regional advisories to high-precision, localized agronomic guidance forms the bedrock of climate resilience.

2. The Intersection of ICT and Technology Dissemination

Information and Communication Technology (ICT) acts as a powerful equalizer in rural landscapes. By bypassing physical geographic barriers, digital tools optimize the speed, accuracy, and cost-effectiveness of extension delivery.

2.1 Mobile Applications and Personalized Advisories

Modern localized mobile platforms enable custom-tailored push notifications based on soil health card (SHC) registries, crop choices, and real-time vegetative growth indexing. Instead of broad, generic regional recommendations, farmers receive precise asset-specific guidance directly on their devices. These apps process geospatial data and historical farming profiles to offer custom calculations for seed rates, fertilizer measurements, and irrigation intervals, translating raw agronomic research into clear field actions.

2.2 Interactive Broadcasting: Phone-In Live Programs and Webcasts

Static mass media (like traditional one-way radio broadcasts) is rapidly evolving into interactive digital formats. Multi-channel collaborations—such as Krishi Vigyan Kendra (KVK) partnerships with rural development networks (e.g., Reliance Foundation)—leverage live YouTube streams, interactive voice response (IVR) systems, and real-time call-in hours. This setup creates a two-way dialogue where scientists can instantly diagnose micro-level field anomalies, correct nutrient mismanagement, and address pest surges in real time. Farmers can upload high-resolution crop images during live webcasts, receiving instantaneous diagnostic protocols that prevent widespread crop failure.

3. Climate-Resilient Extension Methodologies

The primary goal of modern extension is to shift rural mindsets from high-input chemical dependence to climate-adaptive stewardship.

3.1 Mitigating El Niño and Weather Shocks

Extension frameworks must pivot to predictive advisory models before the cropping season starts. Key structural interventions include:

- **Altering Sowing Windows:** Educating communities to realign crop nurseries with delayed monsoons, preventing seed mortality and nursery drying.
- **Varietal Shifts:** Disseminating stress-tolerant, short-duration, and drought-resistant seed varieties tailored to moisture-deficit soils.
- **Ex-Situ Moisture Conservation:** Organizing village-wide method demonstrations on deep summer ploughing, in-situ moisture retention, and micro-irrigation layout architectures to optimize water-use efficiency.

3.2 Organic Carbon Management and Soil Health

A resilient production system begins with the soil matrix. Digital extension mechanisms are heavily targeted toward demystifying Integrated Nutrient Management (INM).



Extension efforts must focus on scaling field-level multiplication of liquid bio-fertilizers over powdered formats due to their longer shelf life, higher microbial load, and superior survival rates under thermal stress. Balanced application ratios based on soil health metrics prevent chemical over-fertilization, stabilize organic carbon indices, and restore native macro-microbial populations.

4. Operational Challenges in Digital Literacy and Infrastructure

Despite the theoretical advantages of digital agricultural extension, structural bottlenecks persist in rural deployment:

- **The Digital Divide:** Marginalized smallholders often lack smart devices or stable network access, leaving them reliant on basic text-based networks or physical intermediaries.
- **Information Overload and Misinformation:** The unregulated proliferation of unverified agricultural advice on unmonitored social networks can lead to improper chemical application, financial loss, or misdiagnosed pest attacks.
- **Lack of Standardization:** Standard Operating Procedures (SOPs) for digital tools—such as drone-based pesticide spraying or automated sensor networks—must be simplified into vernacular languages to gain trust at the grassroots level.

5. Public-Private-Partnerships (PPP) and Institutional Synthesis

To overcome structural bottlenecks, a combined extension framework merging public resources with private technical efficiency is critical.

Institutional Entity	Core Responsibility / Asset	Delivery Channel
State Agricultural Universities (SAUs) & ICAR	Core scientific research, varietal validation, and technical SOP development.	KVKs, SLTP reviews, and formal policy frameworks.
Agricultural Technology Management Agency (ATMA)	Grassroots community mobilization and field-level training execution.	Block-level extension networks and farmer interest groups.
Private AgTech Firms & NGOs	Digital UI/UX optimization, high-speed telecom logistics, and remote sensing infrastructure.	Mobile apps, automated IVR centers, and smart-sensor networks.

By funneling academic knowledge through private tech channels, public entities ensure that information is not only scientifically accurate but also highly accessible and easily digestible for end-users.

6. Comprehensive Literature Review (2020–2026)

The integration of ICT and climate-resilient practices has been extensively documented in recent agricultural research. This section synthesizes twenty core studies published between 2020 and 2026 to outline the evolution of the field.

- **Adoption Drivers of Agri-Apps (Babu *et al.*, 2020):** Investigated the socio-economic factors influencing smartphone app adoption among smallholders. They concluded that literacy and age significantly impact initial adoption, but localized vernacular interfaces dramatically increase sustained engagement.
- **Climate Advisory Scalability (Dhayanithi & Ramasamy, 2020):** Proved that village-level custom agromet advisories reduced input losses by 18% during erratic monsoons by shifting farming focus to real-time predictive agro-meteorology.
- **Bio-fertilizer Dissemination Channels (Kiran & Shahi, 2021):** Compared physical field demonstrations with video-based extensions for liquid bio-fertilizer adoption. They found that while video reached broader audiences, a combined model yielded the highest long-term retention.
- **Digital Divide in Tech-Transfer (Sendilkumar *et al.*, 2021):** Analyzed infrastructure gaps in dryland tracts, highlighting that hybrid models using automated voice alerts (IVRS) are essential for reaching farmers without smartphones.
- **Dhamodaran and Pramanik (2022) on Drone Extensions:** Evaluated the adoption of custom hiring services for drone-based custom chemical spraying, highlighting a 30% reduction in volume use and immediate health safety benefits for labor.
- **ICT-Driven Soil Health Optimization (Ganesan *et al.*, 2022):** Documented how integrating digital Soil Health Card APIs with SMS systems led to a 14% drop in excessive nitrogen use across target villages.
- **El Niño Response Strategies (Rao & Reddy, 2022):** Highlighted the success of proactive mobile notifications regarding drought-resistant options during the El Niño cycle, helping stabilize rural income levels.
- **FPO Digitization Models (Murthy & Kumar, 2023):** Reviewed digital extension tools within Farmer Producer Organizations, showing that shared mobile dashboards improved collective bargaining and market access.

- **Private Extension Frameworks (Singh & Mishra, 2023):** Explored corporate-backed advisory apps, noting high user satisfaction with user interfaces but identifying gaps in location-specific diagnostic validation.
- **Interactive Broadcasting Efficacy (Kishore & Rajasekhar, 2023):** Demonstrated that real-time live video Q&A webcasts resulted in a 40% faster diagnostic response to pink bollworm infestations compared to traditional paper bulletins.
- **Smart Irrigation Dissemination (Verma & Patel, 2024):** Used sensor-linked mobile notifications to manage irrigation schedules, confirming water savings of up to 25% in intensive rice-growing zones.
- **Community Radio Integration (Reddy *et al.*, 2024):** Proved that community radio paired with instant messaging systems kept older farmers engaged during abrupt climate shifts.
- **AI Diagnostics in Extension (Sharma & Nair, 2024):** Evaluated early image-recognition AI engines for leaf-disease detection, showing promising field accuracy but noting a need for broader local datasets.
- **Organic Transition Blockers (Kumar & Das, 2024):** Identified that lacking clear, step-by-step digital guides for organic transition creates an information gap that slows down chemical reduction efforts.
- **PPP Extension Models (Mohapatra & Jena, 2025):** Analyzed collaborative frameworks between public research and private networks, finding that shared resources improved advisory accuracy and extended reach.
- **Precision Nutrient Advisories (Bera *et al.*, 2025):** Evaluated location-specific fertilizer algorithms via mobile apps, reporting improved crop yields and lowered cultivation costs for small-scale farmers.
- **Climate Extension Policy Frameworks (Anand & Joshi, 2025):** Outlined structural shifts required to integrate climate-smart targets into district extension programs, emphasizing institutional accountability.
- **Mobile Micro-Learning for Farmers (Patil & Deshmukh, 2025):** Assessed short video modules for technology transfer, showing that 60-second clips increased the adoption of soil-moisture conservation practices by 35%.
- **Digital Advisory Trust Metrics (Gowda & Swamy, 2026):** Highlighted that farmers trust digital advice far more when it is validated by institutional partners like local KVK scientists rather than private sources alone.

- **Data-Driven Agri-Food Transformation (Jones *et al.*, 2026):** Synthesized the role of automated digital dashboards in tracking regional pest outbreaks, proving that early digital warnings help communities manage risks collectively.

Conclusion and Future Directions

The survival of smallholder agriculture relies on transforming traditional knowledge frameworks into agile, digital, and climate-smart extension networks. Integrating ICT platforms into public extension centers like Krishi Vigyan Kendras (KVKs) allows for rapid responses to environmental pressures. Future efforts should focus on integrating artificial intelligence (AI) predictive models with hyper-local weather datasets, ensuring that extension services evolve from reactive solutions into predictive safeguards for global food security.

References

1. Anand, S., & Joshi, P. (2025). Climate extension policy frameworks and institutional restructuring. *Journal of Agricultural Policy and Research*, 41(2), 145-158.
2. Babu, S. C., *et al.* (2020). Smartphone applications and smallholder technology adoption. *Agricultural Extension Review*, 32(4), 210-224.
3. Balaji, V., Meera, S. N., & Dixit, S. (2021). *ICTs in Agricultural Extension: Realities and Potentials*. Indian Council of Agricultural Research.
4. Bera, K., *et al.* (2025). Precision nutrient advisories via mobile interfaces. *Indian Journal of Agronomy*, 70(1), 45-56.
5. Dhamodaran, T., & Pramanik, S. (2022). Drone extensions and custom hiring models in localized crop protection. *AgTech Development Letters*, 18(3), 89-101.
6. Dhayanithi, M., & Ramasamy, K. (2020). Climate advisory scalability during erratic monsoons. *Journal of Climate Smart Agriculture*, 12(2), 77-88.
7. Ganesan, R., *et al.* (2022). ICT-driven soil health optimization networks. *Soil Science and Extension Practice*, 29(3), 301-314.
8. Gowda, N., & Swamy, M. (2026). Trust metrics in institutional digital advisories. *Extension Education Quarterly*, 38(1), 12-25.
9. Jones, J. W., Antle, J. M., Basso, B., & Thornton, P. K. (2026). Digital innovations transforming agri-food systems under changing climate scenarios. *Agricultural Systems*, 192, 103-115.
10. Kiran, U., & Shahi, A. (2021). Bio-fertilizer dissemination channels: A comparative field analysis. *Journal of Sustainable Farming Systems*, 15(1), 54-68.
11. Kishore, M. R., & Rajasekhar, N. (2023). Interactive broadcasting efficacy in pest emergency responses. *ANGRAU Extension Dispatch*, 11(2), 112-124.

12. Kumar, A., & Das, S. (2024). Organic transition blockers and information gaps in sub-tropical tracts. *Organic Agriculture Management*, 22(4), 410-422.
13. Mohapatra, S., & Jena, B. (2025). PPP extension models: Synergizing public science with private logistics. *Development Review*, 33(3), 289-304.
14. Murthy, P., & Kumar, S. (2023). FPO digitization models and community collective bargaining. *Agribusiness and Extension Economics*, 45(1), 102-116.
15. Patil, R., & Deshmukh, V. (2025). Mobile micro-learning impacts on dryland agricultural practices. *Modern Extension Methods*, 14(2), 85-96.
16. Rao, V., & Reddy, G. (2022). El Niño response strategies through real-time agro-met notifications. *Climate Risk Management in Agriculture*, 20(2), 167-179.
17. Reddy, M., et al. (2024). Community radio integration with instant messaging apps. *Journal of Rural Communication*, 52(3), 215-228.
18. Sendilkumar, V., et al. (2021). Digital divide in tech-transfer landscapes of arid regions. *Rural Sociology and Technology*, 27(2), 143-156.
19. Sharma, P., & Nair, A. (2024). AI diagnostics in extension: Field evaluations of automated leaf-disease analysis. *Computers and Electronics in Agriculture*, 215, 108-121.
20. Singh, H., & Mishra, R. (2023). Private extension frameworks and locations-specific tech validation gaps. *Journal of Agricultural Extension Education*, 35(3), 54-67.
21. Verma, S., & Patel, N. (2024). Smart irrigation dissemination using sensor-linked alerts. *Water Resource Management*, 39(1), 99-112.

APPLIED EXTENSION METHODOLOGIES FOR CLIMATE ADAPTATION: THE SOCIO-ECONOMIC IMPACT OF FARMER FIELD SCHOOLS

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Abstract

Climate change poses an unprecedented threat to global food security, disproportionately affecting smallholder farmers in developing regions. To mitigate these risks and enhance adaptive capacity, the adoption of Climate-Smart Agriculture (CSA) practices is imperative. However, traditional top-down agricultural extension models often fail to translate complex climate data into actionable, context-specific farming practices. This chapter evaluates the Farmer Field School (FFS) approach as an experiential learning model that fosters grassroots resilience. By placing farmers at the center of learning, FFS encourages observation, experimentation, and implementation of CSA techniques. The chapter examines FFS through experiential learning frameworks and empirical evidence of CSA adoption. It further explores localized extension models in Andhra Pradesh, India, including Polam Badi, Polam Pilusthondhi, and Khet Bachhao Abhiyan. These initiatives reduce chemical dependency, promote bio-fertilizers, address climate anomalies such as El Niño, strengthen social capital, and support proactive climate adaptation. The chapter concludes with policy recommendations for scaling decentralized, climate-resilient agricultural systems worldwide.

Keywords: Farmer Field Schools, Climate-Smart Agriculture, Experiential Learning, Grassroots Resilience, Agricultural Extension, Climate Change Adaptation, Polam Badi, Polam Pilusthondhi, Khet Bachhao Abhiyan.

Introduction

The escalating impacts of climate change—characterized by erratic rainfall patterns, rising average temperatures, prolonged dry spells, and the increased frequency of extreme weather events—have severely destabilized traditional agricultural systems worldwide. Smallholder farmers, who produce a significant portion of the global food supply and dominate the agrarian landscapes of South Asia and Sub-Saharan Africa, are particularly vulnerable. This vulnerability

is compounded by their high dependence on rain-fed agriculture, fragmented landholdings, and historically limited access to modern financial and technological resources.

In response to these systemic threats, the Food and Agriculture Organization (FAO) introduced the concept of Climate-Smart Agriculture (CSA). CSA is not a single specific agricultural technology, but an integrative approach aimed at achieving three distinct pillars: sustainably increasing agricultural productivity and incomes; building resilience and adaptive capacity to climate change; and reducing or removing greenhouse gas emissions (mitigation) where possible. Despite the scientifically proven benefits of CSA—ranging from conservation agriculture and zero-tillage to integrated nutrient management and the deployment of drought-resilient crop varieties—widespread adoption at the grassroots level remains sluggish. A primary barrier to this adoption lies in the structural deficiencies of traditional agricultural extension services. For decades, extension systems relied on a top-down "transfer of technology" approach (such as the Training and Visit system), where scientific knowledge was generated in research stations and subsequently "delivered" to farmers. This linear model often fails to account for the highly localized, heterogeneous, and complex agro-ecological realities of smallholder farming. Furthermore, it treats farmers as passive recipients of knowledge rather than active innovators.

Recognizing this critical gap, development agencies, agricultural universities, and regional governments have increasingly turned to participatory paradigms, most notably the Farmer Field School (FFS) methodology. Originating in Southeast Asia in the late 1980s as a response to pesticide-induced pest outbreaks in rice cultivation, FFS has evolved into a robust, adaptable platform for comprehensive climate change education and sustainable agricultural transformation.

This chapter aims to evaluate the profound impact of the FFS experiential learning model on the adoption of CSA practices. By exploring the theoretical frameworks of adult learning and delving into highly successful regional adaptations in Andhra Pradesh, India, this chapter illustrates how hands-on, peer-to-peer learning builds enduring grassroots resilience against climate shocks.

Methodology

This chapter employs a qualitative analytical approach, drawing upon a comprehensive review of existing literature, theoretical frameworks, and documented case studies regarding Farmer Field Schools and Climate-Smart Agriculture. The core methodology relies on synthesizing empirical data from agricultural development reports, peer-reviewed journals, and institutional publications.

To bridge the gap between global theory and localized practice, this chapter conducts an in-depth case study analysis of state-sponsored agricultural extension programs in Andhra Pradesh, India.

Data and operational insights are drawn from the implementation frameworks of the Department of Agriculture, Acharya N. G. Ranga Agricultural University (ANGRAU), and various Krishi Vigyan Kendras (KVKs), specifically utilizing the ICAR-ATARI Zone-X frameworks. By evaluating the operational mechanics and field-level outcomes of specific programs (*Polam Badi*, *Polam Pilusthondhi*, and *Khet Bachaao Abhiyan*), this chapter assesses the correlation between participatory learning interventions, soil health improvement, and long-term CSA adoption rates.

Experiential Learning: The Theoretical Foundation of FFS

The pedagogical strength of the FFS model lies in its radical departure from didactic, classroom-style instruction. FFS operates on the fundamental principles of adult non-formal education and experiential learning. These principles dictate that adults learn best when the subject matter is immediately relevant to their livelihoods, when they are actively involved in the learning process, and when they can integrate new knowledge with their existing, deeply ingrained practical experiences.

This approach is intrinsically aligned with David Kolb's Experiential Learning Cycle, which outlines learning as a continuous process involving four stages:

- **Concrete Experience:** Learning by doing.
- **Reflective Observation:** Learning by reflecting on the experience.
- **Abstract Conceptualization:** Learning by thinking and forming new theories.
- **Active Experimentation:** Learning by applying these theories to make decisions.

In a typical FFS setting, a cohort of 20 to 30 local farmers meets regularly—usually weekly or bi-weekly—in a designated community field throughout an entire crop cycle, from seed selection to post-harvest. The field itself acts as the primary classroom.

Farmers engage in "concrete experience" by establishing comparative plots. One plot is cultivated utilizing conventional, localized practices (often characterized by heavy chemical use and traditional broadcasting), while the adjacent plot employs proposed CSA techniques (e.g., test-based nutrient application, bio-fertilizers, or integrated pest management).

The core activity of every FFS session is the Agro-Ecosystem Analysis (AESA). Through AESA, farmers conduct structured "reflective observation." Small groups enter the field to systematically observe and record data on crop health, soil moisture, beneficial insect populations, pest dynamics, and weather impacts. They draw these observations on large charts, leading to "abstract conceptualization." Facilitators—who act as guides rather than lecturers—help the farmers analyze their drawings, understand the ecological interactions at play, and link local phenomena to broader climate shifts. Finally, farmers engage in "active experimentation"

by collectively making crop management decisions for the FFS plot, which they later apply directly to their own private landholdings.

State-Led Localization: The Andhra Pradesh Paradigm

While the standard FFS model is globally recognized, its ultimate success depends entirely on localized adaptation. In India, the state of Andhra Pradesh provides one of the most compelling blueprints for institutionalizing participatory learning to combat climate anomalies, enhance soil health, and drive sustainable farming. The state has successfully interwoven the experiential FFS framework with dynamic, proactive outreach campaigns, resulting in three distinct yet highly synergistic models: *Polam Badi*, *Polam Pilusthondhi*, and grassroots awareness drives like the *Khet Bachaao Abhiyan*.

1. Polam Badi (Farm School): Institutionalizing Grassroots Science

The Concept: *Polam Badi*, translating literally to "Farm School" in Telugu, is the localized adaptation of the Farmer Field School model spearheaded by the Government of Andhra Pradesh. The primary objective of Polam Badi is to empower farmers to take scientifically backed, ecologically sound decisions directly in their fields, thereby reducing the cost of cultivation, increasing productivity, and minimizing environmental degradation. It shifts the farmer's role from a passive consumer of agro-chemicals to an active manager of their agro-ecosystem.

Success Story: Reducing Chemical Dependency and Enhancing Soil Health in Paddy and Cotton A defining success of the Polam Badi program has been its systemic impact on soil health management, particularly in addressing the rampant overuse of chemical fertilizers like Urea and Di-ammonium Phosphate (DAP). In districts heavily focused on intensive agriculture, traditional practices often equated higher chemical inputs with higher yields, a misconception that severely degraded soil carbon and microbiology over time.

Through Polam Badi, farmers were introduced to the absolute necessity of Soil Test-Based Fertilizer Recommendations. In a documented 14-week Polam Badi cycle focusing on Kharif crops like paddy and high-density planting system (HDPS) cotton, farmers established control and experimental plots.

During the AESA sessions, farmers visually compared the root development and soil texture of plots heavily dosed with DAP against those treated with balanced nutrition and organic amendments. The experiential learning was profound: farmers learned to identify nutrient deficiency symptoms on leaves rather than preemptively dumping Urea. Furthermore, Polam Badi heavily promoted the integration of bio-fertilizers (such as *Azotobacter*, *Phosphotica*, and *Mycorrhiza*) and bio-pesticides.

By the end of the crop cycle, the data spoke for itself. Participating farmers routinely observed that the Polam Badi plots—which utilized 20-30% less chemical fertilizer—not only matched but often exceeded the yields of the conventional plots. The reduced cost of inputs directly increased net income. More importantly, the farmers gained the confidence to drastically cut their Urea and DAP usage on their private holdings, replacing them with sustainable bio-fertilizers. This shift is a cornerstone of Climate-Smart Agriculture, directly addressing both soil resilience (adaptation) and the reduction of nitrous oxide emissions (mitigation).

2. Polam Pilusthondhi (The Farm is Calling): Proactive Extension and Climate Contingency

The Concept: While *Polam Badi* creates deep, intensive knowledge among a cohort over a season, *Polam Pilusthondhi* ("The Farm is Calling") represents a massive scale-up of extension reach. It is a proactive, campaign-mode program where agricultural department officials, alongside scientists from Krishi Vigyan Kendras (KVKs) and agricultural universities (like ANGRAU), leave their offices and travel directly to the villages two days a week.

Success Story: Navigating El Niño and Weather Anomalies The true value of *Polam Pilusthondhi* becomes glaringly apparent during periods of severe climate stress, such as El Niño years, which frequently disrupt the Southwest Monsoon across South India. When an El Niño event triggers delayed monsoons or mid-season droughts, traditional extension models are too slow to react.

Through the *Polam Pilusthondhi* framework, KVK scientists and extension officers can rapidly disseminate Kharif crop contingency plans directly to the village squares. For instance, if rains are delayed beyond July, officials use these village meetings to advise farmers to abandon long-duration paddy varieties in favor of short-duration millets or drought-resilient pulses.

Furthermore, *Polam Pilusthondhi* serves as the vital link between farmers and modern digital agriculture tools. During these village visits, extension workers facilitate the onboarding of farmers onto mobile-based advisory applications like *Kisan Sarathi* and *Meghdoot*. These applications provide hyper-local, real-time agromet advisories. By teaching farmers how to access and interpret this digital data during a *Polam Pilusthondhi* session, the extension system effectively democratizes climate intelligence. A farmer equipped with timely weather forecasts can make a "climate-smart" decision to delay sowing or irrigation by a few days, saving critical resources and preventing crop failure.

3. Khet Bachhao Abhiyan: Campaign-Driven Soil Conservation

The Concept: To supplement the structured learning of Polam Badi and the routine outreach of Polam Pilusthondhi, institutions like ICAR-ATARI Zone-X and local KVKs (such as KVK

Garikapadu) occasionally launch highly focused, intensive awareness campaigns. A prime example is the *Khet Bachaao Abhiyan* (Save the Farm Campaign).

Success Story: High-Impact Immersion Designed as an intensive, multi-week campaign, the *Khet Bachaao Abhiyan* mobilizes agricultural experts to conduct back-to-back village and farm visits with a singular thematic focus: soil health and sustainable farming. Unlike routine extension, this abhiyan operates with a sense of urgency.

During the campaign, extension specialists utilize high-visibility tools—banners, village-level rallies, and mass soil-sample collection drives. The campaign focuses heavily on creating immediate awareness about the long-term devastation caused by unbalanced chemical farming. By integrating efforts with local Farmer Producer Organizations (FPOs), the *Khet Bachaao Abhiyan* not only raises awareness but immediately links farmers to the supply chains for bio-fertilizers and organic inputs. This intensive campaign acts as a catalyst; it creates the initial behavioral shift and motivation that drives farmers to subsequently enroll in long-term *Polam Badi* programs, creating a continuous loop of sustainable agricultural education.

Building Grassroots Resilience and Social Capital

The synergistic effect of these programs extends far beyond technical agricultural skills. The FFS model, and its Andhra Pradesh variants, serve as powerful catalysts for building social capital—a critical, often overlooked component of grassroots resilience.

Climate change adaptation cannot be achieved in isolation; it requires robust collective action. Managing a communal watershed, organizing a localized seed bank for drought-resistant varieties, or collectively bargaining for bio-inputs requires a community that trusts one another and collaborates effectively.

Because programs like *Polam Badi* require farmers to meet weekly, analyze data collectively, and reach consensus on field management, they inadvertently foster strong networks of trust and reciprocity. This enhanced social cohesion translates directly into economic empowerment. It is common for *Polam Badi* alumni groups to transition into formalized Farmer Producer Organizations (FPOs). As an FPO, these educated farmers can bypass exploitative middlemen, collectively procure genuine bio-fertilizers at wholesale rates, and aggregate their sustainably grown produce for better market prices.

Furthermore, these participatory models focus heavily on the inclusion of marginalized groups, particularly women farmers. Women often bear the brunt of climate change impacts—managing household food security and water collection during droughts—yet they historically have the least access to traditional, male-dominated extension services. By ensuring female participation and empowering women as decision-makers and AESA facilitators, *Polam Badi* ensures a more holistic, equitable, and effective approach to community-wide resilience.

Challenges and Limitations

Despite the overwhelming success of these experiential learning models, significant challenges remain in scaling them uniformly.

- **Financial and Human Resource Intensity:** The primary challenge is scalability. Polam Badi is intensive; it requires highly trained facilitators, logistical support, and consistent funding over an entire agricultural season. The cost per farmer is inherently higher than simply broadcasting a radio advisory or distributing a generic pamphlet.
- **Facilitator Capacity:** The success of an FFS is deeply dependent on the quality of the facilitator. If an extension worker is poorly trained or reverts to a top-down lecturing style rather than facilitating peer-to-peer discovery, the experiential nature of the program collapses. Continuous capacity building for extension staff in adult psychology and complex climate science is required.
- **Systemic Barriers:** Education alone cannot overcome severe structural deficits. A farmer who graduates from a Polam Badi fully understanding the benefits of micro-irrigation or solar pumps may still fail to adopt them if they lack land tenure, face insurmountable barriers to institutional credit, or lack access to reliable supply chains for CSA technologies. Experiential learning must be paired with enabling economic policies.

Conclusion

The transition toward Climate-Smart Agriculture is no longer an optional upgrade; it is an urgent necessity to safeguard global food systems and rural livelihoods against the accelerating ravages of climate change. This chapter has demonstrated that Farmer Field Schools, and their localized adaptations, represent one of the most effective mechanisms for driving this transition at the grassroots level.

By fundamentally altering the paradigm of agricultural extension from a top-down monologue to a participatory dialogue, experiential learning models demystify complex climate science, transforming it into practical, localized, and actionable solutions. As evidenced by the success of Andhra Pradesh's *Polam Badi* and *Polam Pilusthondhi* initiatives, as well as intensive drives like the *Khet Bachaao Abhiyan*, situating the farmer at the center of the learning process yields profound results. These programs not only successfully reduce dependency on chemical inputs and accelerate the adoption of sustainable practices, but they also build the vital social infrastructure—trust, collective action, and FPOs—necessary for long-term community resilience.

To maximize the potential of these models, governments and international development partners must transition from viewing FFS as isolated, donor-funded projects to integrating them as the foundational methodology within national climate adaptation frameworks. Future efforts must

focus on reducing implementation costs by cultivating decentralized, farmer-led facilitator networks (where successful alumni train their peers). Crucially, educational interventions must be tightly coupled with structural support, including targeted microcredit, accessible index-based crop insurance, and robust supply chains for sustainable inputs. Ultimately, building true grassroots resilience against climate change requires trusting farmers as capable co-creators of knowledge—a paradigm that participatory experiential learning successfully champions.

References

1. Morton, J. F. (2007). The impact of climate change on smallholder and subsistence agriculture. *Proceedings of the National Academy of Sciences*, 104(50), 19680–19685.
2. Lipper, L., Thornton, P., Campbell, B. M., Baedeker, T., Braimoh, A., Bwalya, M., et al. (2014). Climate-smart agriculture for food security. *Nature Climate Change*, 4(12), 1068–1072.
3. Waddington, H., Snilstveit, B., Hombrados, J. G., Vojtkova, M., Phillips, D., Davies, P., et al. (2014). Farmer Field Schools for improving farming practices and farmer outcomes: A systematic review. *Campbell Systematic Reviews*, 10(1), 1–335.
4. Kolb, D. A. (2014). *Experiential learning: Experience as the source of learning and development* (2nd ed.). Pearson Education.
5. Friis-Hansen, E., & Duveskog, D. (2012). The empowerment route to well-being: An analysis of Farmer Field Schools in East Africa. *World Development*, 40(2), 414–427.
6. Mudege, N. N., Nyekanyeka, T., Kapalasa, E., Chevo, T., & Demo, P. (2015). Understanding the impact of Farmer Field School interactions on gender dynamics and power relations in Malawi. *Journal of Rural Studies*, 42, 122–130.
7. Government of Andhra Pradesh. (2019). *Guidelines on implementation of Polam Badi*. Department of Agriculture, Government of Andhra Pradesh.
8. Prasad, R., & Shivay, Y. S. (2015). Fertilizer nitrogen use efficiency in Indian agriculture. *Indian Journal of Agronomy*, 60(2), 173–181.
9. Indian Council of Agricultural Research. (2022). *Role of Krishi Vigyan Kendras (KVKs) in climate resilient agriculture*. ICAR-ATARI Zone-X Publications.

CHILD-CENTRIC SYSTEM TYPE TEACHER ATTITUDE

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Abstract

Prepose: The teacher, by keeping the student at the center, greatly helps the student in shaping his future through his knowledge. Due to which the foundation of the student's overall development is formed. As a part of which this study has been undertaken. Therefore, the purpose of this study is to examine the impact of a type of school, area and medium of education on teachers' attitudes toward a child-centric system.

Methodology: A 2x2x3 factorial design has been used in this study. A purposive sampling method was used to select 600 teachers in Gujarat. The collection of data was carried out with the help of teacher's attitudes scale. The data was analyzed using the 'F' test.

Finding: The findings of this study show that there is no significant difference in the main effect of medium of education, area, and type of school in teacher child-centered system type attitude. Furthermore, this study finds significant differences across the interaction effects of medium of education, area and type of school on child-centered system type attitudes.

Keywords: Child-Centric System Type Teacher Attitude, Medium of Teaching, Area and Types of School.

Introduction

The child is at the centre of school education. In addition, the teacher is known as an indispensable aspect for the development of the child. Therefore, in school education, the interaction between the student, the teacher and the school makes school education effective. School education can only be effective when the teachers who teach the students are effective. This means that the effectiveness of the teacher is indispensable. It is not only necessary but also indispensable for the teacher to be at the centre while teaching the student. Since the child is at the centre of education, the teacher has to act as a facilitator for the student. So that the child can learn the content in his own convenient and creative way. This study has been conducted keeping this in mind. As well-defined by Allport (1935), "Attitude is a mental or neural state of readiness, organized through experience, exerting a directive or dynamic influence upon individual's response to all objects and situations with which it is related".

The main purpose of Jadeja's (2019) research was to "study the attitude of secondary school teachers towards education in the context of their area of residence. The results showed that teachers from urban areas had more positive attitudes towards education than teachers from rural areas, and science teachers had higher attitude scores." Patel and Vyas (2018) found that job satisfaction is more in permanent and government school employees than in assistant and grant-in-aid school employees. There is more difference in job involvement in assistant and grant-in-aid school employees than in permanent and government school employees. Significant differences are observed between professional engagement and job satisfaction between staff of subsidized and permanent grant aided and government schools. Zalawadia (2019) found that there is a negative correlation between organizational commitment and job satisfaction and union involvement.

Bala (2017) found that there is no difference in job satisfaction of secondary school teachers in terms of caste and region. The aim of Gohil's (2016) research was to "compare the attitudes of primary teachers based on their area of residence. The results of this study showed that there was a significant difference in the attitudes of teachers from rural and urban areas, with the attitudes of urban teachers being more progressive." Thakor (2019)'s research aimed to "examine the impact of training on teachers' attitudes. The results revealed that the attitudes of trained teachers towards teaching were significantly more positive than those of untrained teachers."

Therefore, in the present study, a study of child-centered system as a type of teachers' attitude has been conducted. Therefore, with this in mind, the objectives of the study are as follows:

Objectives

The objectives of the present study are as follows.

1. To study the main effect of medium of education on child centric system type teacher attitude among Teachers.
2. To study the main effect of area on child centric system type teacher attitude among Teachers.
3. To study the main effect of type of school on child centric system type teacher attitude among Teachers.
4. To study the interaction effect of medium of education and area on child centric system type teacher attitude among Teachers.
5. To study the interaction effect of medium of education and type of school on child centric system type teacher attitude among Teachers.
6. To study the interaction effect of area and type of school on child centric system type teacher attitude among.

7. To study the interaction effect of medium of education, area and type of school on child centric system type teacher attitude among Teachers.

Hypotheses

The following hypotheses will be tested to fulfill the objectives of the study:

1. There will be no significant main effect of medium of education on child centric system type teacher attitude among Gujarati medium and English medium school teachers.
2. There will be no significant main effect of area on child centric system type teacher attitude among tribal and non-tribe area school teachers.
3. There will be no significant main effect of type of school on child centric system type teacher attitude among Government, Grant in aid and Self Finance school teachers.
4. There will be no significant interaction effect of medium of education and area on child centric system type teacher attitude of teachers.
5. There will be no significant interaction effect of medium of education and type of school on child centric system type teacher attitude of teachers.
6. There will be no significant interaction effect of area and type of school on child centric system type teacher attitude of teachers.
7. There will be no significant interaction effect of medium of education, area and type of school on child centric system type teacher attitude of teachers.

Variables

The following variables are included as independent and dependent variables:

Sr. No.	Variable	Nature of Variable	No. of Levels	Levels
1	Medium of Education	Independent Variable	2	• Gujarati • English
2	Area	Independent Variable	2	• Tribal • Non-Tribal
3	Type of School	Independent Variable	3	• Government • Grant-in-Aid • Self-Financed
4	Child-Centric System Type Teacher Attitude	Dependent Variable	1	• Child-Centric System Type Teacher Attitude

Research Design

To conduct the research a 2x2x3 factorial design was used for collecting and analyzing the data:

Type of School (C)	Gujarati (A₁)		English (A₂)		Row Total
	Tribal (B₁)	Non-Tribal (B₂)	Tribal (B₁)	Non-Tribal (B₂)	
Government (C ₁)	50	50	50	50	200
Grant-in-Aid (C ₂)	50	50	50	50	200
Self-Financed (C ₃)	50	50	50	50	200
Column Total	150	150	150	150	600

Sample

A total of 600 teachers has been included as a sample in the present study. This selection has been done through the purposive sampling method of non-probability sampling as per the requirement of the research plan, which is as follows.

Tools

To measure on following standardized tools was used.

(1) Personal Data Sheet:

A Personal Data Sheet develop by researcher who used to collect information about name, medium of education, type of school, Area, Gender, etc.

(2) Teachers Attitudes Inventory:

Since the child-centric system is a type of teacher attitude, the teacher attitude inventory has been used here. In the present research, Teacher Attitude Inventory has been used to measure the independent variable. It has been designed by S. P. Ahluwalia. In this test, a total of 90 statements has been divided into 6 sections. The reliability of this test is found to be 0.79 by split-half and 0.80 by test-retest. while its validity has been shown to be high by subject experts.

Result and Discussion:

Table 1 shos analysis of variance for child-centric system type teacher attitude in relation to medium of education, area and types of school.

In the table 1, examining the main effect in terms of Child-centric system type teacher attitude, it is seen that there is a no-significant difference. Evaluating the above interaction effect, it is found that there are significant differences between medium of education, area and school types, while no significant differences are observed in others.

Table 1: Analysis of variance

Variables	Sum of squares	Df	Mean Sum of Squares	F	Sig. Level
Medium of education (A)	3.23	1	3.23	0.26	NS
Area (B)	1.50	1	1.50	0.12	NS
Types of School (C)	70.02	2	35.01	2.80	NS
A x B	3.53	1	3.53	0.28	NS
A x C	7.96	2	3.98	0.32	NS
B x C	42.07	2	21.03	1.68	NS
A x B x C	173.06	2	86.53	6.91	0.01
SSw	7360.92	588	12.52		
SSt	7662.29	599			
Significant Level: 0.05 = 3.87 0.01 = 6.72					

Main Effects:

Ho₁ There will be no significant main effect of medium of education on child centric system type teacher attitude among Gujarati medium and English medium school teachers.

Table 2 Shows means score on child centric system type teacher attitude of teachers with regards to medium of education (A).

Table 2: Mean Scores on Child-Centric System Type Teacher Attitude of Teachers with Respect to Medium of Education (A)

Variable	N	M	F	Sig. level
Gujarati (A1)	300	38.04	0.26	NS
English (A2)	300	38.19		

The average score shown in Table 2 shows that the difference between the two is negligible. In which the score of Gujarati medium teachers is 38.04 and the score of English medium teachers is 38.19. Therefore, the hypothesis formed earlier is accepted. For testing the hypothesis, the f test has been calculated. The f value is 0.26, which is not significant. This proves that the null hypothesis number 1 is not rejected.

Ho₂ There will be no significant main effect of area on child centric system type teacher attitude among tribal and non-tribe area school teachers.

Table 3 shows mean score on child-centric system type teacher attitude of teachers with regards to area (B)

Table 3: Mean score on child-centric system type teacher attitude of teachers with regards to area (B)

Variable	N	M	F	Sig. level
Tribal Area (B1)	300	38.06	0.12	NS
Non-Tribal Area (B2)	300	38.16		

The mean scores in Table 3 reveal that non-tribal teachers acquire a slightly higher score (M=38.16) than tribal teachers (M=38.06) on child-centric system type teacher attitude. For testing hypothesis, an f test has been calculated. The f value is 0.12, which is no significant. It proves that null hypothesis no. 2 is not rejected.

Ho₃ There will be no significant main effect of type of school on child centric system type teacher attitude among Government, Grant in aid and Self Finance school teachers.

Table 4: Means score on child centric system type teacher attitude of teachers with regards to Type of School (C)

Variables (C)	N	M	F	Sig.
Government	200	38.52	2.80	NS
Grant in Aid	200	37.68		
Self-Finance	200	38.15		

The mean scores in Table 4 reveal that government school teachers acquire a slightly higher score (M=38.52) than grant in aid and self-finance school teachers (M=37.68 and 38.15) on child centric system type teacher attitude. For testing hypothesis, an f test has been calculated. The f value is 2.80, which is no significant. It proves that null hypothesis no. 3 is not rejected.

Interaction Effects:

Ho₄ There will be no significant interaction effect of medium of education and area on child centric system type teacher attitude of teachers.

Table 5: Means score child centric system type teacher attitude of teachers with regards to medium of education and area (AxB)

Variables	Medium of Education (A)		F	Sig.
Area (B)	Gujarati (A ₁)	English (A ₂)	0.28	NS
Tribal (B ₁)	38.07	38.06		
Non-Tribal (B ₂)	38.01	38.31		

The mean scores in Table 5 reveal that English medium and non-tribal teachers acquire a slightly higher score (M=38.31) than Gujarati medium and non-tribal teachers (M=38.01) on child centric system type teacher attitude. For testing hypothesis, an f test has been calculated. The f value is 0.28, which is non-significant. It proves that null hypothesis no. 4 is not rejected.

Ho₅ There will be no significant interaction effect of medium of education and type of school on child centric system type teacher attitude of teachers.

Table 6: Means score on child centric system type teacher attitude of teachers with regards to medium of education and area (AxC)

Variables	Medium of Education (A)		F	Sig.
Types of School (C)	Gujarati (A ₁)	English (A ₂)	0.32	NS
Government (C ₁)	38.28	38.75		
Grant in Aid (C ₂)	37.67	37.69		
Self-Finance (C ₃)	38.17	38.12		

The mean scores in Table 6 reveal that English medium and Government school teachers acquire a slightly higher score (M=38.75) than English medium and self-finance school teachers (M=38.12) on child centric system type teacher attitude. For testing hypothesis, an f test has been calculated. The f value is 0.32, which is no-significant. It proves that null hypothesis no. 5 is not rejected.

Ho₆ There will be no significant interaction effect of area and type of school on child centric system type teacher attitude of teachers.

Table 7: Means score on child centric system type teacher attitude of teachers with regards to area and type of school (BxC)

Variables	Area (B)		F	Sig.
Types of School (C)	Tribal (B ₁)	Non-Tribal (B ₂)	1.68	NS
Government (C ₁)	38.70	38.33		
Grant in Aid (C ₂)	37.26	38.10		
Self-Finance (C ₃)	38.23	38.06		

Table 7 reveal that the mean score of tribal teacher and government teachers acquire a slightly higher score (M=38.70) than the tribal teacher and grant in aid school teachers (M=37.26) on child centric system type teacher attitude. For testing hypothesis, an f test has been calculated. The f value is 1.68, which is no-significant. It proves that null hypothesis no. 6 is not rejected.

Ho₇ There will be no significant interaction effect of medium of education, area and type of school on child centric system type teacher attitude of teachers.

Table 8: Means score on child centric system type teacher attitude of teachers with regards to medium of education, area and type of school (AxBxC)

Variables	Gujarati Medium (A ₁)		English Medium (A ₂)		F	Sig. Level
	Tribal (B ₁)	Non-Tribal (B ₂)	Tribal (B ₁)	Non-Tribal (B ₂)		
Government (C ₁)	38.52	38.04	38.88	38.62	6.91	0.01
Grant in Aid (C ₂)	36.68	38.66	37.84	37.54		
Self-Finance (C ₃)	39.00	37.34	37.46	38.78		

Table 8 reveal that the mean score of Gujarati mediums, tribal and self-finance school teachers acquire a higher score (M=39.00) than English medium, non-tribal area and grant in aid school teachers (M=37.54) on child centric system type teacher attitude. For testing hypothesis, an f test has been calculated. The f value is 6.91, which is significant at 0.01 level. It proves that null hypothesis no. 7 is not accepted.

Conclusion

- No significant difference was found between the Gujarati and English medium school teachers of child-centric system type teacher attitude. So that it was concluded that medium of education has no impact on child centric system type teacher attitude in this study. Therefore, the pre formed hypothesis is not rejected.
- No significant difference was found between the tribal and non-tribal teachers of child-centric system type teacher attitude. So that it was concluded that area has no impact on child centric system type teacher attitude in this study. Therefore, the pre formed hypothesis is not rejected.
- No significant difference was found between the Government, grant in aid school teachers of child-centric system type teacher attitude. So that it was concluded that type of school has no impact on child centric system type teacher attitude in this study. Therefore, the pre formed hypothesis is not rejected.
- No significant difference was found between medium of education and area on child centric system type teacher attitude. Therefore, the pre formed hypothesis is not rejected.
- No significant difference was found between medium of education and type of school on child centric system type teacher attitude. Therefore, the pre formed hypothesis is not rejected.

- No significant difference was found between area and type of school on child centric system type teacher attitude. Therefore, the pre formed hypothesis is not rejected.
- The difference between medium of education, area and type of school on child centric system type teacher attitude is found to be significant at 0.01 level; the Gujarati mediums, tribal and self-finance school teachers have high level of child centric system type teacher attitude than the English medium, non-tribal area and grant in aid school teachers. Therefore, the pre formed hypothesis is not accepted.

References

1. Allport, G. W. (1935). Attitudes. In C. Murchison (Ed.), *A handbook of social psychology* (pp. 798–844). Clark University Press.
2. Jadeja, H. P. (2019). A comparative study of teaching attitude among secondary school teachers of Rajkot. *Journal of Education, 14*(2), 45–50.
3. Patel, B., & Vyas, R. M. (2018). Job satisfaction and job involvement among Sahayak and permanent employees of Gujarat schools. *International Journal of Indian Psychology, 6*(2). <https://www.ijip.in>
4. Zalawadia, T. L. (2019). A study of job satisfaction, organizational commitment and union involvement. *International Journal of Indian Psychology, 7*(2). <https://www.ijip.in>
5. Bala, R. (2017). Job satisfaction of secondary school teachers. *International Journal of Indian Psychology, 4*(4). <https://www.ijip.in>
6. Gohil, S. M. (2016). A comparative study of teacher attitudes in rural and urban areas of Bhavnagar. *Bhavnagar University Journal, 12*(2), 55–62.
7. Thakor, J. G. (2019). A study of attitudes towards inclusive education in North Gujarat schools. *HNGU Journal of Research, 16*(2), 88–95.

EDUCATIONAL TECHNOLOGY AND LEARNING OUTCOMES IN CONTEMPORARY EDUCATION

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Abstract

Teaching methods and learning results have been profoundly impacted by educational technology, which has become a revolutionary force in modern education. This chapter explores the idea and development of educational technology and emphasizes how it fosters student participation, individualized instruction, teamwork, critical thinking, and digital literacy. It covers key educational technologies that have transformed contemporary learning settings, such as learning management systems, multimedia resources, artificial intelligence, virtual and augmented reality, and mobile learning platforms. Key issues and obstacles to technology integration are also covered in this chapter, including the digital divide, poor infrastructure, a lack of teacher preparation, and privacy and accessibility concerns. It also looks at new trends including artificial intelligence, learning analytics, smart classrooms, and hybrid learning models, as well as methods for using technology effectively. In order to improve learning outcomes and prepare students for the demands of an increasingly digital and connected world, equitable, pedagogically sound, and sustainable technology integration is necessary. This is highlighted in the chapter's conclusion, which also highlights the implications for educators, students, educational leaders, and legislators.

Keywords: Educational Technology, Learning Outcomes, Digital Learning, Artificial Intelligence, Contemporary Education, Technology Integration.

1. Introduction

Educational technology has become an integral part of contemporary education, transforming traditional teaching and learning through the use of digital tools, innovative pedagogies, and online learning environments. Rapid developments in digital platforms, mobile learning, artificial intelligence (AI), and information and communication technology (ICT) have drastically changed educational institutions and increased teaching and learning options. Digital technologies today facilitate access, inclusivity, collaboration, and creativity, making education more adaptable and learner-centered. [16].

The development of critical thinking, creativity, communication, teamwork, and digital literacy is becoming more and more important in modern schooling. By encouraging active participation,

individualized instruction, and ongoing evaluation, educational technology plays a significant part in attaining these learning objectives. Learning Management Systems (LMS), multimedia resources, adaptive learning platforms, and AI-based applications are examples of tools that offer potential for interactive and customized training, improving students' academic performance and skill development. Additionally, education is becoming more accessible and flexible because to hybrid and blended learning approaches [13].



Effective technology integration has potential, but it is hampered by issues with digital competency, infrastructure, and fair resource access. As a result, educational technology should be seen as a way to support relevant, inclusive, and high-quality learning experiences rather than just as digital tools [3]. As a result, educational technology has become a potent instrument for improving learning outcomes and getting students ready to engage in a society that is becoming more digital and knowledge-based.

Objectives of the Chapter

- To understand the concept and evolution of educational technology in contemporary education.
- To examine the role of educational technology in enhancing students' learning outcomes.
- To identify the major educational technologies used in modern teaching and learning.
- To explore the challenges and strategies related to the effective integration of educational technology.

- To discuss emerging trends and their implications for teachers, students, and educational stakeholders.

2. Concept of Educational Technology and Learning Outcomes

Learning outcomes and educational technology are two essential elements of modern education that work together to support efficient instruction and significant learning. The methodical use of technology tools, teaching strategies, and learning materials to support and improve the teaching-learning process is known as educational technology. Educational technology is defined as "the study and ethical practice of facilitating learning and improving performance by creating, using, and managing appropriate technological processes and resources" by the Association for Educational Communications and Technology (AECT) [18]. It includes learner-centered pedagogies, online learning environments, artificial intelligence, and data-driven instructional methods in addition to digital devices and software in modern education.

The knowledge, abilities, attitudes, and competences that students are supposed to gain upon finishing an educational program or learning experience are referred to as learning outcomes. They serve as the foundation for curriculum design, instructional techniques, and assessment procedures by outlining precise expectations for what students should know and be able to do. In contrast to merely imparting knowledge, modern education places a strong emphasis on outcome-based learning, which stresses quantifiable accomplishments and lifelong learning [2].

Learning outcomes are generally categorized into three domains:

- **Cognitive outcomes**, which involve knowledge acquisition, understanding, critical thinking, and problem-solving abilities.
- **Affective outcomes**, which include attitudes, values, motivation, collaboration, and socio-emotional development.
- **Psychomotor outcomes**, which relate to practical and technical skills required for effective performance.

In the twenty-first century, educational technology and learning outcomes have become increasingly intertwined. Personalized learning, increased student engagement, teamwork, and the development of critical thinking, creativity, communication, digital literacy, and lifelong learning skills are all facilitated by the integration of digital technologies [9;16]. Therefore, educational technology is a potent tool for attaining high-quality learning outcomes and equipping students for active engagement in a society that is becoming more digitally and knowledge-based.

3. Role of Educational Technology in Enhancing Learning Outcomes

Educational technology plays a significant role in improving learning outcomes by making teaching and learning more interactive, flexible, and learner-centered. The integration of digital technologies into education has transformed traditional classrooms into dynamic learning

environments that promote active participation, collaboration, and personalized learning. The major roles of educational technology in enhancing learning outcomes are as follows

- **Improving Student Engagement and Motivation:** Educational technology makes learning more interesting through multimedia resources, videos, simulations, and gamified activities. Interactive learning environments increase students' motivation and participation, leading to improved academic achievement [12].
- **Supporting Personalized and Self-Paced Learning:** Digital platforms and AI-based tools provide individualized learning experiences according to students' needs and abilities. Immediate feedback and adaptive learning pathways enhance understanding and knowledge retention [16].
- **Promoting Active and Collaborative Learning:** Online discussion forums, virtual classrooms, and collaborative tools encourage interaction and teamwork among learners. These approaches promote active participation and meaningful knowledge construction [1].
- **Enhancing Critical Thinking and Problem-Solving Skills:** Simulations, virtual laboratories, and project-based learning activities help students analyze information and solve real-world problems. Emerging technologies such as AI and virtual reality further support higher-order thinking skills [6].
- **Facilitating Inclusive and Accessible Education:** Assistive technologies and online learning platforms provide learning opportunities for students with diverse abilities and backgrounds. Technology helps promote equitable and inclusive education by increasing accessibility [16].
- **Developing Digital Literacy and Twenty-First Century Skills:** Educational technology helps learners acquire digital literacy, communication, collaboration, creativity, and information-management skills, which are essential for lifelong learning and success in a knowledge-based society [15].

4. Major Educational Technologies Used in Contemporary Education

The rapid advancement of digital technologies has transformed the educational landscape and introduced innovative tools that support effective teaching and learning. Contemporary education increasingly relies on various technologies to facilitate communication, collaboration, personalized learning, and assessment. These technologies not only enhance students' academic achievement but also promote critical thinking, creativity, and digital literacy. Some of the major educational technologies used in contemporary education are discussed below.

- **Learning Management Systems (LMS):** Learning Management Systems (LMS) are digital platforms that facilitate the delivery, management, and assessment of educational content. Systems such as Moodle, Google Classroom, Blackboard, and Canvas enable

teachers to organize course materials, conduct online classes, assign tasks, and monitor student progress. LMS platforms support blended and online learning environments and provide opportunities for continuous interaction between teachers and learners [1].

- **Multimedia and Digital Learning Resources:** Multimedia technologies combine text, audio, video, animation, graphics, and interactive content to enhance learning experiences. Educational videos, presentations, simulations, e-books, and digital libraries make complex concepts easier to understand and increase student engagement. Multimedia resources support different learning styles and encourage active participation [7].
- **Mobile Learning and E-Learning Platforms:** Mobile devices and e-learning platforms have expanded access to education beyond traditional classrooms. Smartphones, tablets, and online learning platforms enable learners to access educational resources anytime and anywhere. Massive Open Online Courses (MOOCs), online tutorials, and digital applications provide flexible and self-paced learning opportunities. Mobile learning promotes lifelong learning and improves accessibility, especially for remote and underserved populations [15].
- **Artificial Intelligence and Adaptive Learning Tools:** Artificial Intelligence (AI) has emerged as a transformative technology in education. AI-powered systems provide personalized learning experiences by analyzing learners' progress and adapting content according to individual needs. Intelligent tutoring systems, chatbots, automated assessment tools, and learning analytics help improve teaching efficiency and student performance. AI also facilitates timely feedback and data-driven decision-making [6].
- **Virtual Reality (VR) and Augmented Reality (AR):** Virtual Reality (VR) and Augmented Reality (AR) create immersive and interactive learning environments. These technologies allow students to visualize abstract concepts, conduct virtual experiments, and explore real-world scenarios in a safe environment. VR and AR are widely used in science, medicine, engineering, and vocational education to enhance experiential learning and improve conceptual understanding [11].
- **Gamification and Interactive Learning Tools:** Gamification involves the use of game elements such as points, badges, rewards, and competitions to increase learner engagement and motivation. Interactive platforms such as Kahoot! Quizizz, and educational games promote active participation and make learning enjoyable. Gamified learning environments encourage collaboration, problem-solving, and knowledge retention [4].
- **Cloud Computing and Collaborative Technologies:** Cloud-based technologies facilitate storage, sharing, and collaborative creation of educational resources. Tools such

as Google Workspace and Microsoft 365 enable students and teachers to collaborate in real time through shared documents, presentations, and virtual meetings. Cloud computing supports flexible and collaborative learning environments and enhances accessibility to educational materials [12].

- **Learning Analytics and Data-Driven Technologies:** Learning analytics involves the collection and analysis of learners' data to monitor progress and improve educational outcomes. Data-driven technologies help educators identify learning gaps, provide personalized interventions, and enhance instructional effectiveness. Learning analytics supports evidence-based decision-making and contributes to improved student achievement [16].

5. Challenges and Barriers in Technology Integration

Although educational technology offers numerous opportunities for improving teaching and learning, its effective integration into education faces several challenges and barriers. The successful use of technology depends not only on the availability of digital tools but also on adequate infrastructure, teacher preparedness, institutional support, and equitable access to resources. Some major challenges and barriers are discussed below.

- **Digital Divide and Accessibility Issues:** One of the most significant barriers to technology integration is the digital divide. Differences in access to computers, internet connectivity, and digital devices create inequalities among learners, particularly those from rural, economically disadvantaged, and marginalized communities. Limited access to digital infrastructure restricts opportunities for quality learning and widens educational disparities [15].
- **Inadequate Infrastructure and Resources:** Many educational institutions face shortages of technological infrastructure, including reliable internet connections, computers, smart classrooms, and maintenance facilities. Insufficient financial resources often hinder the acquisition and upgrading of technological equipment, thereby affecting the effective implementation of digital learning initiatives [16].
- **Lack of Teacher Competency and Professional Training:** Teachers play a crucial role in technology integration; however, many educators lack adequate digital skills and pedagogical knowledge required for effective use of educational technologies. Insufficient training and limited opportunities for professional development often result in underutilization of technological resources. Continuous teacher training is therefore essential for successful technology integration [14].
- **Resistance to Change and Attitudinal Barriers:** Resistance to change among teachers, students, and administrators can hinder the adoption of technology. Some educators may prefer traditional teaching methods due to unfamiliarity with digital tools or concerns

regarding their effectiveness. Negative attitudes, lack of confidence, and fear of technological complexity may reduce willingness to integrate technology into instructional practices [12].

- **Student Distractions and Misuse of Technology:** Although digital technologies support learning, excessive or inappropriate use can lead to distractions and reduced academic focus. Social media, online gaming, and non-educational content may negatively affect students' concentration and learning outcomes. Ensuring responsible and balanced use of technology remains an important challenge [15].
- **Privacy, Security, and Ethical Concerns:** The increasing use of digital platforms and artificial intelligence raises concerns regarding data privacy, cybersecurity, and ethical issues. Educational institutions must protect students' personal information and ensure safe and responsible use of digital technologies. Concerns about data misuse and algorithmic bias have become important issues in contemporary education [16].
- **Technical Problems and Maintenance Issues:** Frequent technical failures, software incompatibility, inadequate technical support, and maintenance problems can disrupt teaching and learning processes. Lack of skilled technical personnel and delayed troubleshooting often discourage teachers and students from using educational technologies effectively [1].
- **Challenges in Pedagogical Integration:** Technology alone does not guarantee improved learning outcomes. Effective integration requires alignment between technology, curriculum, teaching methods, and assessment practices. Inappropriate or excessive reliance on technology without sound pedagogical planning may fail to produce meaningful learning experiences [8].
- **Inequality in Digital Literacy:** Differences in digital literacy among teachers and students can affect the effective utilization of technological resources. Learners with limited technological skills may face difficulties in accessing and using digital learning platforms, thereby influencing their academic performance and participation [16].
- **Need for Policy Support and Sustainable Investment:** Successful technology integration requires supportive policies, adequate funding, and long-term planning. Lack of institutional vision, policy frameworks, and sustainable investments often limits the implementation and scalability of technology-based educational initiatives. Governments and educational institutions must ensure equitable access, infrastructure development, and continuous capacity building to maximize the benefits of educational technology [16].

6. Strategies for Effective Use of Educational Technology

The effective use of educational technology requires more than simply providing digital devices and internet access. Meaningful integration depends on appropriate pedagogical practices, teacher preparedness, institutional support, and equitable access to technological resources. The following strategies can enhance the effective use of educational technology in contemporary education.

- **Providing Continuous Professional Development for Teachers:** Teachers play a central role in the successful integration of technology. Regular training programs, workshops, and professional development opportunities help educators develop digital competencies and pedagogical skills necessary for effective technology use. Continuous capacity building enables teachers to select appropriate tools and design meaningful learning experiences [14].
- **Aligning Technology with Curriculum and Learning Objectives:** Educational technology should be integrated in accordance with curriculum goals and learning outcomes. Digital tools must complement instructional strategies and assessment methods rather than replace sound pedagogical practices. Effective alignment ensures that technology supports meaningful learning and enhances academic achievement [8].
- **Adopting Learner-Centered and Personalized Approaches:** Technology should be used to promote active, collaborative, and personalized learning. Learning Management Systems, adaptive learning platforms, and multimedia resources can address diverse learning styles and individual needs. Learner-centered approaches encourage self-directed learning, critical thinking, and active participation [1].
- **Promoting Blended and Hybrid Learning Models:** Blended learning combines face-to-face instruction with online learning experiences, providing flexibility and continuity in education. Hybrid learning environments allow students to access educational resources anytime and anywhere while maintaining interaction with teachers and peers. Such approaches improve accessibility and enhance learning outcomes [16].
- **Ensuring Equitable Access to Technology:** Providing equal access to digital devices, internet connectivity, and educational resources is essential for reducing educational inequalities. Governments and institutions should address the digital divide by ensuring adequate infrastructure and support for disadvantaged learners and underserved communities [15].
- **Encouraging Collaborative and Interactive Learning:** Collaborative technologies such as discussion forums, video conferencing platforms, and shared digital workspaces encourage communication and teamwork among learners. Interactive learning activities

promote knowledge construction, problem-solving, and social learning, thereby improving student engagement and academic performance [12].

- **Utilizing Continuous Assessment and Feedback:** Digital assessment tools, e-portfolios, quizzes, and learning analytics provide opportunities for continuous monitoring of student progress. Timely feedback helps identify learning gaps and enables teachers to provide appropriate support. Continuous assessment contributes to improved learning outcomes and informed instructional decisions [10].
- **Promoting Digital Literacy and Responsible Technology Use:** Students and teachers should be equipped with digital literacy skills necessary for effective and ethical use of technology. Educational institutions should promote responsible online behavior, cybersecurity awareness, information literacy, and digital citizenship to ensure safe and productive learning environments [16].
- **Strengthening Institutional Support and Leadership:** Effective technology integration requires strong leadership, supportive policies, and adequate financial investment. Educational institutions should establish clear strategies, provide technical support, and encourage innovation in teaching practices. Institutional commitment is essential for the sustainability of technology-enhanced learning initiatives [10].
- **Monitoring and Evaluating Technology Integration:** Regular evaluation of technological initiatives helps determine their effectiveness and identify areas for improvement. Monitoring learning outcomes, user experiences, and technological challenges enables institutions to make evidence-based decisions and ensure continuous improvement in educational practices [15].

7. Emerging Trends in Educational Technology

The rapid advancement of digital technologies is continuously transforming educational practices and creating new opportunities for teaching and learning. Emerging technologies are reshaping traditional classrooms into dynamic, flexible, and learner-centered environments. Some important emerging trends in educational technology are discussed below.

- **Artificial Intelligence in Education:** Artificial Intelligence (AI) is one of the most transformative developments in contemporary education. AI-powered tools such as intelligent tutoring systems, chatbots, automated assessment systems, and adaptive learning platforms provide personalized learning experiences and immediate feedback. These technologies support individualized instruction, enhance learning efficiency, and assist teachers in monitoring student progress [6]. Generative AI tools are increasingly being used to facilitate content creation, tutoring, and academic support [15].
- **Learning Analytics and Big Data:** Learning analytics and big data technologies enable educators to collect, analyze, and interpret learner data to improve instructional practices.

These technologies help identify learning patterns, monitor student progress, predict academic performance, and provide targeted interventions. Data-driven decision-making contributes to improved learning outcomes and more personalized educational experiences [10].

- **Virtual Reality (VR) and Augmented Reality (AR):** Virtual Reality and Augmented Reality are transforming learning through immersive and experiential environments. These technologies allow students to visualize abstract concepts, perform virtual experiments, and interact with simulated environments. VR and AR are increasingly used in science, medicine, engineering, and vocational education to enhance conceptual understanding and practical skills [11].
- **Mobile Learning and Microlearning:** The widespread use of smartphones and tablets has accelerated mobile learning. Mobile applications and cloud-based platforms enable learners to access educational content anytime and anywhere. Microlearning, which involves delivering content in short and focused modules, supports self-paced and lifelong learning. These approaches provide flexibility and increase learner engagement [16].
- **Gamification and Game-Based Learning:** Gamification incorporates game elements such as points, badges, rewards, and leaderboards into educational activities to increase motivation and participation. Game-based learning environments promote active engagement, collaboration, and problem-solving skills. These approaches make learning enjoyable and contribute to improved knowledge retention [4].
- **Hybrid and Blended Learning Models:** Hybrid and blended learning have emerged as sustainable educational models following the COVID-19 pandemic. These approaches combine face-to-face instruction with online learning experiences, offering flexibility and continuity in education. Blended learning environments support personalized learning and improve access to educational resources [10].
- **Internet of Things (IoT) and Smart Classrooms:** The Internet of Things (IoT) is facilitating the development of smart classrooms equipped with interconnected devices and digital resources. Smart technologies enable automated attendance, real-time monitoring, interactive learning, and improved classroom management. IoT-based learning environments enhance communication and provide data for personalized instruction [12].
- **Blockchain Technology in Education:** Blockchain technology is emerging as a secure method for storing and verifying academic records, certificates, and credentials. It provides transparency, authenticity, and easy sharing of educational qualifications.

Blockchain applications have the potential to simplify credential management and support lifelong learning systems [5].

- **Cloud Computing and Collaborative Platforms:** Cloud computing technologies facilitate access to educational resources and support collaboration among learners and educators. Platforms such as Google Workspace and Microsoft 365 enable real-time communication, document sharing, and collaborative learning. Cloud-based systems promote flexibility and support remote and blended learning environments [1].
- **Focus on Digital Citizenship and Ethical Use of Technology:** With increasing reliance on digital technologies, greater attention is being paid to digital citizenship, ethical use of artificial intelligence, cybersecurity, and data privacy. Educational institutions are emphasizing responsible technology use and digital literacy to prepare learners for participation in a digitally connected world [16].

8. Implications for Educational Stakeholders

The growing integration of educational technology has significant implications for various educational stakeholders, including teachers, students, school leaders, curriculum developers, and policymakers. Technology-enhanced learning environments require changes in pedagogical practices, institutional policies, and resource allocation to maximize learning outcomes. The major implications for different stakeholders are discussed below.

- **Implications for Teachers:** Teachers need to move from traditional knowledge transmitters to facilitators and mentors who guide students in technology-rich learning environments. They should continuously update their digital competencies and pedagogical skills through professional development programs. Effective integration of technology requires teachers to design interactive, learner-centered, and inclusive learning experiences that promote critical thinking and collaboration.
- **Implications for Students:** Students are expected to become active participants in the learning process rather than passive recipients of information. Educational technology encourages self-directed learning, collaboration, and problem-solving skills. Learners also need to develop digital literacy, information literacy, and responsible online behavior to effectively utilize digital resources and participate in lifelong learning.
- **Implications for School Leaders and Administrators:** School leaders and administrators play a crucial role in creating supportive environments for technology integration. They are responsible for providing infrastructure, ensuring access to digital resources, organizing professional development programs, and promoting innovation in teaching practices. Effective leadership is essential for implementing technology-related policies and sustaining digital transformation initiatives.

- **Implications for Policymakers and Governments:** Policymakers and governments have the responsibility to formulate policies that support equitable and sustainable technology integration. Investment in digital infrastructure, teacher training, internet connectivity, and educational resources is essential for reducing the digital divide. Policies should also address issues related to accessibility, cybersecurity, ethical use of artificial intelligence, and data privacy to ensure inclusive and safe learning environments.
- **Implications for Parents and Communities:** Parents and communities play an important role in supporting technology-enhanced learning. They can encourage responsible use of digital devices, provide a supportive home learning environment, and collaborate with schools to promote students' academic development. Community participation and partnerships can further strengthen access to technological resources and digital literacy initiatives.
- **Implications for Higher Education Institutions and Researchers:** Higher education institutions and researchers need to explore innovative teaching approaches and evaluate the effectiveness of emerging technologies in education. Research on artificial intelligence, learning analytics, virtual reality, and digital pedagogy can contribute to evidence-based practices and policy development. Continuous research is essential to understand the opportunities and challenges associated with technological advancements in education.

Conclusion

With its ability to make traditional teaching and learning procedures more interactive, adaptable, and learner-centered, educational technology has become a crucial part of modern education. The chapter focused on the idea and development of educational technology, highlighting its increasing importance in improving learning outcomes that are skill-based, emotional, and cognitive. Learning management systems, multimedia resources, artificial intelligence, virtual reality, and mobile learning technologies are just a few of the digital tools and platforms that have opened up new possibilities for enhancing student engagement, individualized instruction, teamwork, and the growth of higher-order thinking abilities. Recent studies show that, when paired with effective pedagogical strategies, technology-enhanced learning can have a favorable impact on student motivation and academic accomplishment. Effective technology integration is nevertheless hampered by issues including the digital divide, poor infrastructure, unprepared teachers, privacy issues, and unequal access to technology resources. Strategic planning, ongoing professional development, supportive policies, and fair access to digital resources are therefore necessary for successful implementation. The chapter also highlighted new developments that would probably influence education in the future, like learning analytics, smart classrooms,

artificial intelligence, and hybrid learning models. Additionally, communities, educators, administrators, legislators, and students all play crucial responsibilities in guaranteeing inclusive and meaningful technological integration. In the end, educational technology should be seen as a potent tool for promoting high-quality learning, creativity, and lifelong skills that are essential for prospering in a society that is becoming more digitally and globally connected.

References

1. Bates, A. W. (2022). *Teaching in a digital age: Guidelines for designing teaching and learning* (3rd ed.). Tony Bates Associates Ltd.
2. Biggs, J., & Tang, C. (2022). *Teaching for quality learning at university* (5th ed.). Open University Press.
3. Claro, M., & Castro-Grau, C. (2023). *The role of digital technologies in 21st century learning*. UNESCO International Institute for Educational Planning.
4. Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From game design elements to gamefulness: Defining gamification. In *Proceedings of the 15th International Academic MindTrek Conference* (pp. 9–15).
5. Grech, A., & Camilleri, A. F. (2017). *Blockchain in education*. Publications Office of the European Union.
6. Luckin, R. (2018). *Machine learning and human intelligence: The future of education for the 21st century*. UCL Institute of Education Press.
7. Mayer, R. E. (2021). *Multimedia learning* (3rd ed.). Cambridge University Press.
8. Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*, 108(6), 1017–1054.
9. Organisation for Economic Co-operation and Development. (2023). *Future of education and skills 2030: Conceptual learning framework*. OECD.
10. Organisation for Economic Co-operation and Development. (2024). *Digital education*. OECD Publishing.
11. Radianti, J., Majchrzak, T. A., Fromm, J., & Wohlgenannt, I. (2020). A systematic review of immersive virtual reality applications for higher education. *Education and Information Technologies*, 25(2), 93–115.
12. Selwyn, N. (2022). *Education and technology: Key issues and debates* (3rd ed.). Bloomsbury Academic.
13. Tawil, S., & Miao, F. (2024). Steering the digital transformation of education: UNESCO's human-centered approach. *Frontiers of Digital Education*, 1(1), 51–58. <https://doi.org/10.1007/s44366-024-0020-0>

14. Tondeur, J., Scherer, R., Siddiq, F., & Baran, E. (2020). Enhancing pre-service teachers' technological pedagogical content knowledge (TPACK): A mixed-method study. *Computers & Education, 157*, 103967.
15. UNESCO. (2023). *Global education monitoring report 2023: Technology in education—A tool on whose terms?* UNESCO.
16. UNESCO. (2024). *Digital learning and transformation of education*. United Nations Educational, Scientific and Cultural Organization.
17. UNESCO. (2024). *Global education monitoring report 2024: Leadership in education*. UNESCO.
18. Januszewski, A., & Molenda, M. (2008). *Educational technology: A definition with commentary*. Lawrence Erlbaum Associates.

AI IN BUSINESS AND MANAGEMENT EDUCATION

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Abstract

Artificial Intelligence (AI) is revolutionizing business and management education by reshaping teaching methodologies, learning experiences, assessment mechanisms, and workforce preparation. The increasing adoption of AI-powered technologies, including machine learning, learning analytics, intelligent tutoring systems, and generative AI applications, has created new opportunities for personalized education and enhanced student engagement. Business schools worldwide are integrating AI-related competencies into their curricula to prepare graduates for digitally transformed workplaces. At the same time, the rapid growth of AI raises concerns regarding academic integrity, ethical governance, algorithmic bias, and data privacy. This review paper critically examines the role of AI in business and management education through four major dimensions: AI-enabled personalized learning, AI-driven teaching and curriculum innovation, assessment and ethical challenges, and future directions for AI-supported management education. The chapter highlights emerging opportunities and challenges while emphasizing the need for responsible and human-centered AI adoption. The study concludes that AI should complement rather than replace educators, fostering enhanced learning outcomes and preparing future business leaders for an increasingly data-driven world.

Keywords: Artificial Intelligence, Business Education, Management Education, Generative AI, Learning Analytics, Higher Education.

1. Introduction

The Fourth Industrial Revolution has accelerated the integration of advanced digital technologies into organizational and societal systems. Among these technologies, Artificial Intelligence (AI) has emerged as one of the most influential innovations shaping business operations, strategic decision-making, and workforce development [1]. As organizations increasingly rely on AI-driven solutions, educational institutions face growing pressure to equip students with the knowledge and competencies required to succeed in technology-intensive environments. Business and management education occupies a critical position in this transformation because future managers and organizational leaders will be expected to understand, adopt, and govern AI technologies effectively [2]. Traditional business education has focused on areas such as leadership, finance, marketing, strategy, and organizational behavior. However, the emergence of AI and data-driven business models has expanded the scope of managerial competencies.

Today's graduates are expected to possess analytical capabilities, digital literacy, and the ability to collaborate with intelligent systems [3].

The recent rise of generative AI technologies, including large language models, has further accelerated educational transformation. AI-powered tools can generate educational content, provide personalized tutoring, support research activities, and facilitate knowledge discovery [4]. These technologies have created opportunities to improve educational accessibility, efficiency, and learner engagement. Business schools increasingly employ AI-based systems to personalize learning experiences, automate administrative tasks, and enhance pedagogical effectiveness [5]. Despite these advantages, AI adoption in education remains controversial. Scholars have raised concerns regarding ethical implications, algorithmic bias, privacy risks, and academic integrity challenges [6]. Furthermore, excessive dependence on AI technologies may undermine critical thinking, creativity, and independent problem-solving abilities if not implemented responsibly [7]. This chapter examines the growing influence of AI in business and management education. Specifically, it explores how AI is transforming personalized learning, curriculum innovation, assessment practices, and future educational models. By synthesizing contemporary literature, the paper provides insights into both the opportunities and challenges associated with AI integration in management education.

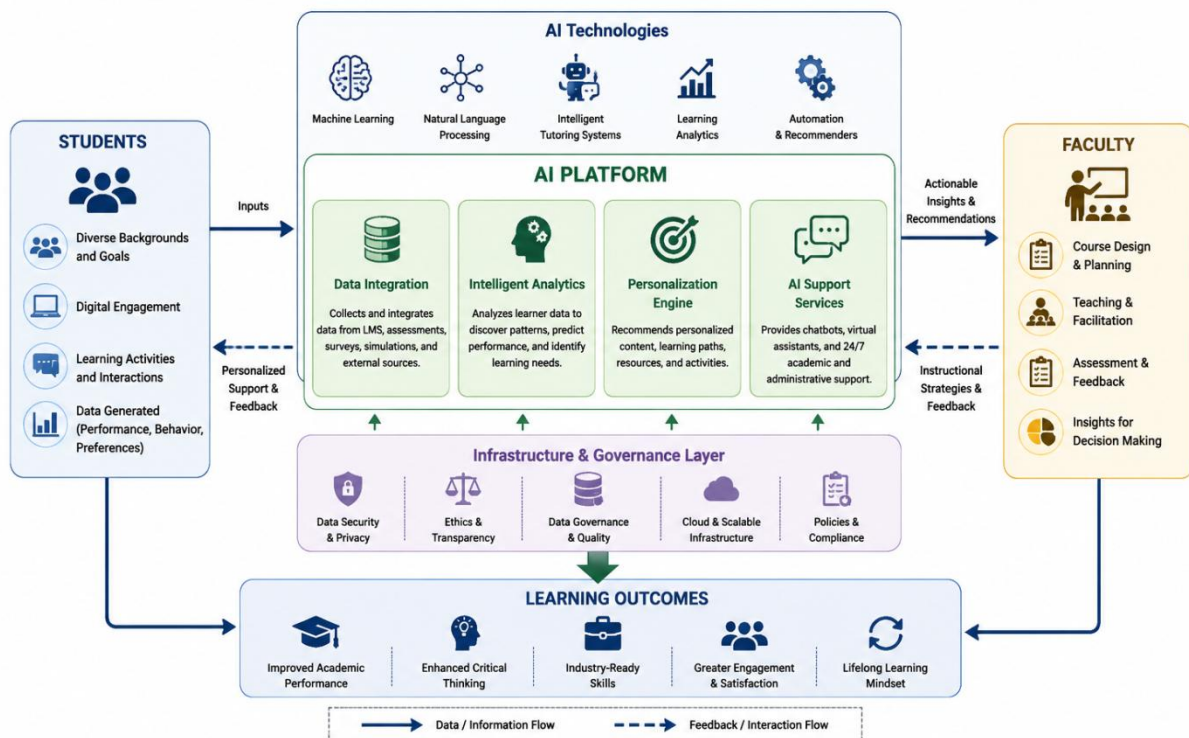


Fig. 1. AI ecosystem in business and management education.

2. AI - Enabled Personalized Learning in Business and Management Education

One of the most significant contributions of AI to education is the development of personalized learning environments. Traditional educational systems often adopt standardized instructional

approaches that assume learners possess similar educational backgrounds and learning preferences. However, students enrolled in business programs frequently exhibit considerable diversity in terms of prior knowledge, professional experience, and learning objectives [8]. AI-powered adaptive learning systems address these challenges by analyzing learner behavior and tailoring educational content according to individual needs. Machine learning algorithms can evaluate student performance, identify learning gaps, and recommend personalized learning pathways [9]. These systems continuously adjust instructional materials based on student progress, enabling more effective knowledge acquisition. Personalized learning is particularly valuable in business education because learners often come from multidisciplinary backgrounds. For example, MBA students may include engineers, healthcare professionals, entrepreneurs, and finance specialists. AI-based platforms can customize learning experiences to accommodate these varying educational profiles, thereby improving engagement and learning outcomes [10].

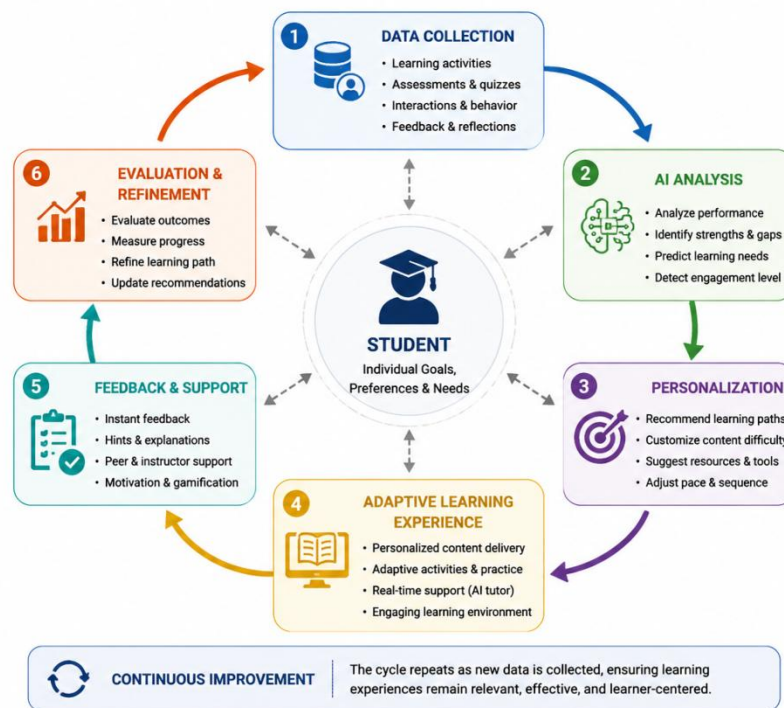


Fig. 2. Adaptive personalized learning cycle.

Generative AI has further enhanced personalization capabilities. AI-driven virtual assistants can provide immediate responses to student inquiries, generate customized explanations, summarize complex concepts, and recommend supplementary learning resources [11]. Such capabilities allow students to learn at their own pace and receive individualized support outside traditional classroom settings. Another important application involves learning analytics. Educational institutions increasingly collect large volumes of learner data through learning management systems and digital platforms. AI algorithms analyze these datasets to identify patterns associated with student success or academic difficulties [12]. Instructors can use these insights to provide timely interventions and improve retention rates. AI also supports lifelong learning and

professional development. Business professionals must continuously update their knowledge to remain competitive in rapidly changing industries. AI-powered learning platforms facilitate continuous education by recommending skill development opportunities based on career goals, industry trends, and competency assessments [13].

Despite these benefits, challenges remain. Personalized learning systems rely heavily on data collection, raising concerns regarding privacy, surveillance, and informed consent [14]. Furthermore, excessive dependence on AI-generated guidance may discourage independent thinking and self-directed problem-solving. Therefore, educators must ensure that AI enhances rather than replaces human learning processes. Overall, AI-enabled personalized learning represents a major advancement in business and management education. By adapting educational experiences to individual learner needs, AI contributes to improved engagement, academic performance, and workforce readiness.

3. AI - driven Teaching, Curriculum Design, and Learning Analytics

AI is not only transforming student learning but also reshaping teaching practices and curriculum development. Business schools increasingly recognize that graduates require AI literacy and digital competencies to succeed in contemporary organizations [15]. Consequently, educational institutions are redesigning curricula to incorporate AI-related knowledge and skills. One significant application of AI involves instructional design. Generative AI systems assist educators in developing course materials, creating case studies, generating discussion questions, and designing assessments [16]. These technologies reduce administrative workloads and enable instructors to focus more on mentoring, facilitation, and student engagement.

Curriculum innovation has become a strategic priority for many business schools. Courses focusing on business analytics, AI strategy, digital transformation, machine learning applications, and responsible AI governance are increasingly integrated into management programs [17]. Such curricular reforms reflect growing employer demand for graduates capable of leveraging AI technologies to create organizational value. Experiential learning represents another area where AI demonstrates substantial potential. Business education has traditionally relied on case studies, simulations, and project-based learning. AI-powered simulations provide realistic business environments in which students can practice decision-making, analyze complex datasets, and evaluate strategic alternatives [18]. These immersive experiences strengthen practical skills and improve students' readiness for professional challenges.

Learning analytics further support evidence-based teaching practices. AI systems analyze classroom interactions, assessment performance, and engagement metrics to provide instructors with actionable insights [19]. Educators can identify struggling students, evaluate instructional effectiveness, and optimize course delivery based on data-driven evidence. Moreover, AI facilitates collaborative learning environments. Intelligent platforms can recommend relevant

resources, match students with complementary skill sets, and support virtual teamwork activities [20]. Such capabilities are particularly relevant in business education, where collaboration and communication skills remain essential managerial competencies.

However, successful AI integration requires faculty preparedness. Many educators lack sufficient training in AI technologies and may experience uncertainty regarding implementation strategies [21]. Institutions must therefore invest in faculty development programs that enhance digital literacy and pedagogical innovation. Although AI enhances instructional effectiveness, human educators remain indispensable. Leadership development, ethical reasoning, interpersonal communication, and critical reflection cannot be fully automated. Effective business education requires a balanced approach in which AI serves as an enabling technology while educators continue to provide mentorship, guidance, and contextual understanding.

4. Assessment, Academic Integrity, and Ethical challenges

Assessment constitutes one of the most debated dimensions of AI adoption in higher education. AI technologies offer substantial opportunities to improve evaluation processes, provide timely feedback, and support learning analytics. Simultaneously, they introduce complex ethical and academic integrity concerns [22]. AI-powered assessment systems can automate grading procedures and provide immediate feedback to learners. Automated evaluation tools enable educators to manage large classes efficiently while maintaining consistent assessment standards [23]. Students benefit from rapid feedback, which supports continuous improvement and self-regulated learning. Learning analytics also contribute to assessment effectiveness. AI algorithms identify performance trends, predict academic outcomes, and support early intervention strategies. Such capabilities enable educators to address learning difficulties before they significantly affect student success [24].

The emergence of generative AI has fundamentally challenged traditional assessment methods. Students can now use AI systems to generate essays, reports, presentations, and case analyses with minimal effort [25]. This development raises questions regarding originality, authorship, and academic honesty. Consequently, educational institutions are increasingly redesigning assessment practices. Authentic assessments such as presentations, simulations, reflective journals, and project-based assignments emphasize critical thinking and real-world application rather than content reproduction [26]. These approaches encourage deeper learning and reduce opportunities for inappropriate AI use. Ethical concerns extend beyond academic integrity. Algorithmic bias remains a significant challenge because AI systems may inherit biases present in training data [27]. Biased algorithms can produce unfair outcomes, reinforce stereotypes, and undermine educational equity. Business schools must therefore educate students about responsible AI development and governance.

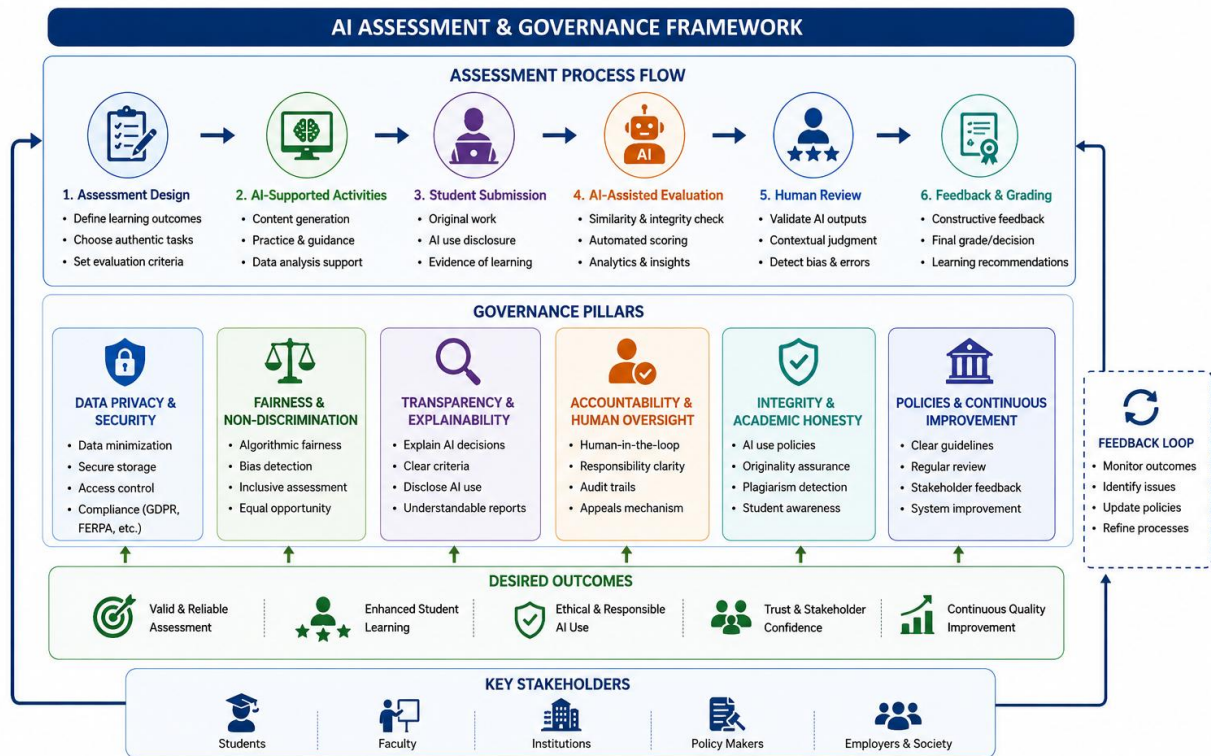


Fig. 3. AI assessment and governance framework.

Privacy concerns are equally important. AI-powered educational systems often collect extensive learner data, including behavioral patterns, academic performance, and personal information. Institutions must implement robust data governance frameworks to ensure transparency, security, and regulatory compliance [28]. Another concern involves explainability and accountability. Many AI systems operate as “black boxes,” making it difficult to understand how decisions are generated [29]. In management education, students must learn to critically evaluate AI outputs rather than accepting recommendations without scrutiny.

Addressing these challenges requires comprehensive governance frameworks that integrate ethical principles, regulatory compliance, and stakeholder engagement. Human oversight remains essential to ensure fairness, accountability, and responsible AI deployment in educational environments.

5. Future Directions of AI in Business and Management Education

The rapid evolution of Artificial Intelligence (AI) is expected to reshape the future landscape of business and management education in unprecedented ways. While current AI applications focus primarily on personalized learning, intelligent tutoring, learning analytics, and automated assessment, future developments are likely to create more adaptive, immersive, and human-centered educational ecosystems. Business schools and higher education institutions will increasingly integrate AI technologies into their strategic planning to prepare graduates for digitally transformed workplaces. One of the most significant future developments will be the establishment of AI literacy as a core managerial competency. Similar to financial literacy and

digital literacy, AI literacy is expected to become a fundamental requirement for business graduates. Future managers will need to understand how AI systems function, interpret algorithmic outputs, evaluate risks, and make informed decisions based on AI-generated insights [25]. Business schools are therefore expected to integrate AI concepts across disciplines such as marketing, finance, operations, human resource management, and strategic management.

Another emerging trend is the growth of AI-powered lifelong learning ecosystems. Rapid technological change is continuously altering workforce skill requirements, making lifelong learning essential for career sustainability. AI-driven learning platforms will increasingly provide personalized learning recommendations based on individual career goals, competency gaps, and industry demands [26]. Such systems will enable professionals to acquire relevant skills through micro-credentials, digital certifications, and adaptive training programs throughout their careers. The future of business education will also witness the expansion of human-AI collaboration models. Rather than replacing human intelligence, AI will function as a collaborative partner supporting decision-making, problem-solving, and innovation. Educational institutions will increasingly focus on teaching students how to effectively interact with AI systems while maintaining critical thinking, creativity, and ethical judgment [27]. The ability to combine human intuition with machine intelligence is likely to become a defining characteristic of successful managers.

Another important development involves the integration of immersive learning technologies such as AI-powered virtual reality (VR), augmented reality (AR), and metaverse-based learning environments. These technologies can create realistic business simulations that allow students to experience complex managerial situations in safe and controlled settings. Such experiential learning environments can improve decision-making capabilities, leadership skills, and strategic thinking [28]. The role of generative AI in educational content creation is also expected to expand significantly. Future AI systems may generate customized case studies, simulations, assessments, and learning materials based on specific learning objectives and student profiles. This capability could enhance educational efficiency and enable highly personalized learning experiences [29]. However, educational institutions will need robust quality assurance mechanisms to ensure the accuracy and reliability of AI-generated content.

Ethical governance will remain a central priority in future AI adoption. As AI systems become increasingly sophisticated, concerns related to algorithmic bias, transparency, accountability, and privacy are expected to intensify. Business schools must therefore strengthen educational programs focused on responsible AI governance and ethical decision-making [30]. Future leaders will require competencies that enable them to balance technological innovation with societal responsibilities. Furthermore, institutions are expected to adopt AI-supported predictive analytics for student success management. By analyzing behavioral, academic, and engagement data, AI

systems can identify at-risk students and recommend timely interventions. Such approaches may improve student retention, academic performance, and overall educational outcomes [31].

Finally, interdisciplinary collaboration will become increasingly important. Future business education programs are likely to integrate knowledge from computer science, data science, behavioral science, ethics, and management studies. This interdisciplinary approach will prepare graduates to address complex organizational challenges in AI-driven environments and promote innovation across sectors [32]. Overall, the future of AI in business and management education will be characterized by greater personalization, enhanced collaboration between humans and intelligent systems, immersive learning experiences, and stronger emphasis on ethical governance. Institutions that proactively embrace these developments will be better positioned to prepare future-ready graduates capable of leading organizations in an increasingly intelligent and data-driven world.

Conclusion

Artificial Intelligence is transforming business and management education by enhancing personalized learning, improving teaching effectiveness, and supporting data-driven decision-making. AI-powered technologies enable adaptive learning experiences, intelligent assessment systems, and innovative curriculum designs that better prepare students for modern business environments. The integration of AI also promotes lifelong learning and helps develop skills relevant to the digital economy. However, challenges related to academic integrity, data privacy, algorithmic bias, and ethical governance require careful attention. Educational institutions must establish responsible AI policies to ensure transparency, fairness, and accountability. Human educators remain essential for fostering critical thinking, leadership, creativity, and ethical reasoning. Therefore, AI should be viewed as a complementary tool that augments rather than replaces human expertise. By balancing technological innovation with human-centered educational values, business schools can create more effective and inclusive learning environments. Ultimately, the successful integration of AI will play a crucial role in preparing future managers and leaders capable of thriving in an increasingly intelligent and data-driven world.

References

1. Schwab, K. (2016). *The fourth industrial revolution*. World Economic Forum.
2. Dwivedi, Y. K., Hughes, L., Ismagilova, E., Aarts, G., Coombs, C., Crick, T., Duan, Y., Dwivedi, R., Edwards, J., Eirug, J., Galanos, V., Ilavarasan, P. V., Janssen, M., Jones, P., Kumar, T., Lal, B. K., Misra, M., Mogaji, A., Sharma, S., & Upadhyay, R. (2021). Artificial intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. *International Journal of Information Management*, 57, 101994.

3. Mhlanga, M. (2023). Artificial intelligence in higher education: A bibliometric analysis and review. *International Journal of Educational Technology in Higher Education*, 20(1), 1–24.
4. Denny, P., Gulwani, S., Heffernan, N. T., Hemberg, B. M., & Becker, A. (2024). *Generative AI for education (GAIED): Advances, opportunities, and challenges* (arXiv Preprint arXiv:2402.01580).
5. Farrokhnia, A. M., Banihashem, S. K., Noroozi, O., & Wals, H. (2024). A SWOT analysis of ChatGPT: Implications for educational practice and research. *Innovations in Education and Teaching International*, 61(3), 460–474.
6. UNESCO. (2023). *Guidance for generative AI in education and research*. UNESCO Publishing.
7. Holmes, W., & Tuomi, K. (2022). *State of the art and practice in AI in education*. Publications Office of the European Union.
8. Zawacki-Richter, J., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education. *International Journal of Educational Technology in Higher Education*, 16(1), 1–27.
9. Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). *Intelligence unleashed: An argument for AI in education*. Pearson Education.
10. Ifenthaler, M., & Gibson, D. (2020). *Adoption of data analytics in higher education learning and teaching*. Springer.
11. Kasneci, E., Sessler, K., Küchemann, M., Bannert, M., Dementieva, D., Fischer, F., Gasser, U., & Groh, G. (2023). ChatGPT for good? On opportunities and challenges of large language models for education. *Learning and Individual Differences*, 103, 102274.
12. Siemens, G., & Baker, R. S. J. d. (2012). Learning analytics and educational data mining: Towards communication and collaboration. In *Proceedings of the 2nd International Conference on Learning Analytics and Knowledge* (pp. 252–254).
13. Brown, A., & Nic Giolla Mhichíl, S. (2022). *Artificial intelligence and lifelong learning: Future opportunities and challenges*. UNESCO Institute for Lifelong Learning.
14. Prinsloo, M., & Slade, S. (2017). Student privacy self-management: Implications for learning analytics. *British Journal of Educational Technology*, 48(3), 731–742.
15. Bughin, J., Seong, J., Manyika, J., Chui, M., & Joshi, R. (2018). *Notes from the AI frontier: Modeling the impact of AI on the world economy*. McKinsey Global Institute.
16. Tlili, A., Shehata, B., Agyemang, M., Bozkurt, A., Hickey, D., Huang, R., & Burgos, D. (2023). What if the devil is my guardian angel? ChatGPT as a case study of using chatbots in education. *Smart Learning Environments*, 10(1), 1–24.

17. George, A. (2024). Artificial intelligence and business education: Emerging curriculum transformations. *Journal of Management Education*, 48(1), 25–42.
18. Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Prentice Hall.
19. Ferguson, R. (2012). Learning analytics: Drivers, developments and challenges. *International Journal of Technology Enhanced Learning*, 4(5–6), 304–317.
20. Selwyn, N. (2019). *Should robots replace teachers? AI and the future of education*. Polity Press.
21. Organisation for Economic Co-operation and Development. (2023). *Digital education outlook 2023: Towards an effective digital education ecosystem*. OECD Publishing.
22. Coates, T. (2024). Assessment redesign in the age of artificial intelligence. *Assessment & Evaluation in Higher Education*, 49(2), 115–128.
23. Baker, R. S., & Inventado, P. (2014). Educational data mining and learning analytics. In J. A. Larusson & B. White (Eds.), *Learning analytics* (pp. 61–75). Springer.
24. Dawson, S., Macfadyen, L., & Gašević, D. (2019). The potential of learning analytics for improving student success. *Educational Technology & Society*, 22(1), 1–5.
25. McDonald, N., Johri, A., Ali, A., & Hingle, A. (2024). *Generative artificial intelligence in higher education: Evidence from an analysis of institutional policies and guidelines* (arXiv Preprint arXiv:2402.01659).
26. World Economic Forum. (2025). *The future of jobs report 2025*. World Economic Forum.
27. Brynjolfsson, E., & McAfee, A. (2014). *The second machine age: Work, progress, and prosperity in a time of brilliant technologies*. W. W. Norton & Company.
28. Radianti, J., Majchrzak, T. A., Fromm, J., & Wohlgenannt, I. (2020). A systematic review of immersive virtual reality applications for higher education. *Education and Information Technologies*, 25(3), 1839–1886.
29. Bozkurt, A. (2023). Generative artificial intelligence and educational content creation: Emerging opportunities and challenges. *Open Praxis*, 15(2), 150–165.
30. European Commission. (2019). *Ethics guidelines for trustworthy artificial intelligence*. European Commission.
31. Leitner, P., Khalil, M., & Ebner, M. (2017). Learning analytics in higher education—A literature review. *Educational Sciences*, 7(1), 1–23.
32. Bozkurt, A., Huang, R., Zawacki-Richter, O., Bond, M., & Noroozi, O. (2024). Artificial intelligence and the future of higher education: Interdisciplinary perspectives. *Educational Technology Research and Development*, 72(1), 1–18.

BORDERS, IDENTITY, AND FEMINIST RESISTANCE IN GEETANJALI SHREE'S TOMB OF SAND

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Abstract

Geetanjali Shree's *Tomb of Sand*, first published in Hindi as *Ret Samadhi* in 2018 and translated into English by Daisy Rockwell in 2021, became the first Hindi novel to win the International Booker Prize in 2022. The novel follows an eighty-year-old widow, known only as Ma, who withdraws into silence after her husband's death and then, unexpectedly, comes back to life. Her journey eventually takes her across the India-Pakistan border, back to the place where she grew up before Partition. This article looks at how the novel uses the idea of the border, between countries, between generations, and between men and women, to ask what it really means to be free. It argues that Shree turns the border from a wall that shuts people in into a line that can be crossed, redrawn, and even befriended. Read this way, Ma's late-life journey becomes a quiet but powerful act of feminist resistance, one that the novel's own loose, playful style helps to carry.

Keywords: Geetanjali Shree, *Tomb of Sand*, Partition, Feminist Resistance, Ageing, Identity, Border Studies.

Introduction

Geetanjali Shree's *Tomb of Sand* made history in 2022 when it became the first Hindi novel to win the International Booker Prize. But the novel matters for more than this achievement. When it first appeared in India in 2018 as *Ret Samadhi*, it was already being talked about for its bold, unusual style. At its centre is an eighty-year-old woman the novel calls only "Ma." After her husband dies, she takes to her bed, turns her face to the wall, and seems to give up on the world. Everyone around her reads this as old age finally catching up with her. What follows proves them wrong.

This article is about borders, the border between India and Pakistan that Ma eventually crosses, but also the quieter borders that hem in a woman's life: the border between being seen as useful and being seen as finished, between speaking and staying silent, between one's own desires and the roles a family expects one to play. In South Asian writing, the border usually means one thing above all: the violent line drawn across the subcontinent in 1947, the line that divided neighbours, languages, and families overnight. Shree does not look away from that violence. But

she also refuses to let the border stay only a wound. She turns it into a question, and Ma spends the novel trying to answer it.

The chapters that follow take up this question one piece at a time. They begin with the inherited weight of Partition memory, then turn to Ma's withdrawal into silence as a private form of protest, before looking at how the novel rewrites the meaning of the border itself. From there, the discussion moves to what it means for an old woman, specifically, to become the centre of a feminist story, and closes with Ma's friendship with Rosie, which extends the novel's border-crossing spirit into the territory of gender. Read together, these threads show a single, patient argument: that every line society treats as fixed, between nations, between young and old, between man and woman, is in fact something people made, and something people can choose to cross.

The Border as Inherited Wound

For most South Asian readers, the word "border" carries the weight of 1947. Partition split a shared land into two new countries and forced millions of people to leave homes their families had lived in for generations. It is usually remembered as a line that cannot be uncrossed, a permanent scar on the map and on memory. *Tomb of Sand* inherits this history but refuses to treat it as closed and finished. Ma's own past reaches back to a girlhood on the other side of that line, and the novel slowly reveals that her long silence after her husband's death is tied to a much older, unhealed loss from her Partition years.

What makes the novel distinctive is how it tells this story. Instead of one straight timeline, it moves back and forth, mixing the present-day comedy of a fussy, modern family with sudden, quiet glimpses of historical pain. A crow that comments on the household, a door that is never quite shut, an old walking stick with a mind of its own, these small, almost playful details carry the larger weight of memory. The effect is that grief and humour sit side by side, never fully separated, which mirrors how memory itself actually works: not as a single clean story, but as fragments that surface when they are least expected.

This way of telling the story also has a quieter purpose. By refusing to keep the family's ordinary squabbles, household routines, and small jealousies separate from the larger history of Partition, the novel suggests that big historical events do not simply happen and then end. They keep living inside ordinary households, in the way a mother is treated, in the things a family chooses not to talk about, in the silences that get passed down without anyone meaning to pass them down at all. Ma's long, unexplained withdrawal at the start of the novel turns out to be one of those silences finally breaking open.

Ma's Tomb: Withdrawal as Protest

When the novel opens, Ma has stopped speaking to her family and lies facing the wall of her room. Her son Bade treats this as something to be managed, a problem of an ageing mother who

needs to be looked after and kept safe. He sees her as someone to be protected, which in practice means someone to be controlled. The novel sums up this narrow view of who Ma is allowed to be in one blunt line: “Ma was Ma only in a sari” (Shree 382). In other words, her family can only recognise her through the role she is expected to play, dutiful widow, quiet mother, harmless old woman, and nothing more.

Read this way, Ma’s silence is not really surrender. It is a kind of protest, even if no one around her understands it as one. She has spent her life being a daughter, a wife, and a mother, roles chosen for her rather than by her, and at eighty she is expected to fade quietly into the background, “shrouded in white” and asking for nothing. By refusing to play along, by simply lying still and giving the family nothing to manage, Ma builds the very “tomb” of the novel’s title, a space cut off from everyone’s expectations. What happens next is that she chooses, on her own terms, to come back out of it.

Re-imagining the Border

The most striking idea in the novel is its rethinking of what a border actually is. Shree does not let the word stay fixed to its usual meaning, a wall, a wound, a line that only separates. At one point the novel describes a border in almost the opposite terms, as something that frames and strengthens rather than divides: “A border does not enclose, it opens out” (Shree, trans. Rockwell). The passage goes on to suggest that a border can be more like a decorative edge than a wall, a place where two sides meet and both are made stronger by the meeting, rather than a line where one side ends and the enemy begins.

This shift matters because it changes the meaning of Ma’s journey to the Wagah border and beyond it into Pakistan. She is not just crossing a checkpoint guarded by soldiers. She is reclaiming a part of her own life that the nation-state decided, in 1947, she was no longer allowed to have. The novel suggests that people carry their homelands inside themselves no matter what lines are drawn on a map, and that memory and belonging do not have to obey the straight lines that colonial mapmakers and modern governments prefer. In this sense, Ma’s walk across the border becomes proof that the line, however official it looks, was never as absolute as it claimed to be.

Old Age as a Site of Resistance

Much feminist fiction focuses on young women claiming independence, choosing careers, or asserting control over their own bodies and relationships. *Tomb of Sand* does something less common: it places an old woman, a widow, at the very centre of its feminist argument. Indian society generally expects a widow to disappear quietly into family life, to give up colour, pleasure, and any claim to her own wants. Ma is expected to do exactly this. Instead, she gets up, leaves the house her son controls, and slowly builds a life that is hers alone.

This refusal extends to her body as well as her choices. Widowhood is supposed to mean physical restraint and silence, a kind of living renunciation. Ma's body, in the second half of the novel, stops being a symbol of decline and becomes instead a site of memory, movement, and even pleasure. The scholar Gayatri Chakravorty Spivak has written about how women on the margins of society are rarely allowed to tell their own histories in their own words. Shree answers this directly by making an old woman the one who carries and narrates the novel's deepest history, not through official records, but through memory, gossip, and stories told aloud. Ma's voice, in other words, becomes a quiet challenge to the kinds of history that only trust governments and documents.

Her family's discomfort with this change is itself telling. Bade and his wife are not cruel people; they genuinely believe they are caring for Ma in the proper way, feeding her, watching over her, deciding what is best for her. Their confusion when she stops cooperating shows how deeply the idea of the passive, grateful elderly widow is built into ordinary family love, so that even well-meaning relatives cannot easily imagine an old woman simply wanting something for herself. Ma's daughter, Beti, who thinks of herself as the modern, liberated one in the family, is similarly unsettled to discover that her mother's new freedom does not need her approval or her guidance. The novel uses this friction gently, with humour rather than anger, but the point underneath is serious: even people who love a woman can still be the ones holding the door of her tomb shut.

The novel also leans on a light touch of magic and strangeness to make this resistance feel possible. At one point Ma appears almost to slip through the wall she has been facing for so long, a moment that blurs the line between the real and the fantastic. This touch of the uncanny is not just decoration. It gives Ma a way out of a world built entirely on rational, male-controlled rules, a world where an eighty-year-old widow is not supposed to want anything new. The fantastic becomes, briefly, a door she can walk through that her family cannot see.

Crossing Gender: Ma and Rosie

One of the novel's most important relationships is the friendship between Ma and Rosie, a transgender woman. Both characters live at the edges of what their society considers normal, one because of her age, the other because of her gender identity, and both are treated by Ma's family as faintly embarrassing or even shameful. The novel, however, treats their bond with warmth rather than suspicion. Their friendship crosses the very lines, of gender, religion, and generation, that families and nations usually insist on guarding most carefully.

This friendship does not pretend that Ma and Rosie are the same, or that their differences disappear. Instead, it shows two people choosing each other across a divide that society has worked hard to keep in place. In a novel so concerned with borders, this small, personal alliance carries a large meaning: it suggests that the lines separating people are most often kept alive by

habit and fear, and that they soften the moment two people simply decide to stand on the same side of them.

It is worth noticing, too, that this friendship grows precisely in the part of Ma's life her family finds hardest to control. Once she leaves her son's house, the people she chooses to spend time with are no longer selected for her by family duty or social respectability, but by her own liking. Rosie is not someone Ma's relatives would have introduced into the household; she is someone Ma finds for herself, on her own terms, once she is finally free to look. The friendship therefore becomes proof of something larger than affection: it shows what a woman's life can look like once it is no longer arranged entirely by other people's sense of what is proper.

Conclusion

Tomb of Sand is, at its heart, a story about refusing to stay inside the tomb that other people build for you, whether that tomb is made of grief, old age, gender expectations, or a line drawn on a map. By placing an eighty-year-old widow at the centre of this refusal, Geetanjali Shree asks readers to rethink how history, gender, and nationhood actually get made, not only in parliaments and treaties, but in the small daily decisions of ordinary people. Ma's real victory is simple: she does not die quietly inside the role she was given. She gets up, walks, remembers, and reaches across a border that was supposed to be permanent.

Shree's larger point is that resistance does not need to be loud or dramatic to matter. Often it looks like nothing more than an old woman turning away from a wall, deciding that her story is not yet finished, and choosing to walk towards whatever comes next.

References

1. Butler, J. (1990). *Gender trouble: Feminism and the subversion of identity*. Routledge.
2. Butalia, U. (2000). *The other side of silence: Voices from the Partition of India*. Duke University Press.
3. Sharma, M. (2023). Gender, memory and nation in Geetanjali Shree's *Tomb of Sand*. *Indian Literature*, 67(3), 118–132.
4. Shree, G. (2021). *Tomb of sand* (D. Rockwell, Trans.). Tilted Axis Press.

NAVIGATING THE ECO-ANXIETY CONSUMER WAVE: AN EMPIRICAL FRAMEWORK FOR TRANSPARENT ESG DISCLOSURE AND AUTHENTICITY MANAGEMENT IN RETAIL ECOSYSTEMS

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Abstract

The modern retail sector is experiencing a major transformation as consumers increasingly consider environmental sustainability in their purchasing decisions. Rising eco-anxiety has encouraged demand for greater transparency in Environmental, Social, and Governance (ESG) practices while increasing skepticism toward misleading sustainability claims. This chapter examines how authentic ESG communication can strengthen consumer trust and reduce concerns about greenwashing in omni-channel retail environments. Using consumer survey data, natural language processing (NLP) of sustainability disclosures, and structural equation modeling (SEM), the study explores the relationship between eco-anxiety, perceived brand authenticity, and customer loyalty. The findings reveal that vague sustainability claims increase consumer skepticism, whereas verified and transparent ESG disclosures enhance brand credibility and significantly improve long-term customer retention. The study further demonstrates that perceived corporate authenticity acts as a psychological bridge, converting climate-related concerns into positive consumer engagement and advocacy. The proposed framework provides retailers with practical strategies to promote transparency, strengthen stakeholder trust, and support sustainable business growth.

Keywords: Eco-Anxiety, ESG Disclosure, Brand Authenticity, Retail Ecosystems, Greenwashing Skepticism.

1. Introduction

1.1 Background and Context

The global retail industry is facing a very unstable consumer landscape. Environmental responsibility has changed from a minor marketing preference to a main requirement. Over the past ten years, increasing climate issues have pushed corporate sustainability from being a side topic in corporate social responsibility reports to a key factor in how consumers make choices.

1.2 The Phenomenon of Consumer Eco-Anxiety

Eco-anxiety is defined as a chronic, pervasive psychological apprehension concerning global environmental collapse and planetary degradation. This mental state manifests as active behavioral modifications, as modern consumers increasingly internalize global ecological degradation, leading to heightened defensive buying patterns and intense scrutiny of corporate manufacturing practices.

Table 1: Consumer Eco-Anxiety Breakdown

Core Dimension	Empirical Definition & Market Manifestation
Conceptual Definition	A chronic, pervasive psychological apprehension concerning global environmental collapse and planetary degradation.
Psychological Trigger	Modern consumers increasingly internalize systemic, global ecological degradation.
Behavioral Impact	Translates directly into active behavioral modifications across choice architectures.
Market Consequences	Development of heightened defensive buying patterns and intense scrutiny of corporate manufacturing practices.

1.3 ESG Disclosure Trends in Corporate Retail

The major retail companies have substantially increased reporting of performance on Environmental, Social and Governance (ESG) issues to protect institutional capital and goodwill among consumers. But, the absence of standardized metrics has led to a highly fractured reporting landscape that is dominated by narrative-heavy qualitative descriptions that frequently obscure verifiable quantitative performance data.

Table 2: ESG Disclosure Trends & Market Friction

Core Dynamic	Operational Reality & Market Impact
Primary Drivers	Financial: Securing critical institutional capital. Reputational: Preserving consumer goodwill in the marketplace.
Corporate Action	Retail enterprises have substantially increased their Environmental, Social, and Governance (ESG) performance disclosures.
Systemic Bottleneck	A distinct lack of standardized reporting metrics across the corporate ecosystem.
Market Outcome	A highly fractured reporting environment where narrative-heavy qualitative descriptions frequently overshadow verifiable quantitative performance data.

1.4 The Greenwashing Crisis and Institutional Skepticism

The rise of unverified corporate eco-claims has brought about a dire greenwashing crisis in global consumer markets. With all of these vague marketing terms like “eco-friendly”, “carbon-

neutral” or “responsibly sourced” thrown around by marketing departments without any real proof, consumer skepticism is at an all-time high, making it difficult for genuine sustainability initiatives to stand out from the crowd.

Table 3: The Greenwashing Crisis & Skepticism Architecture

Analytical Factor	Corporate Reality & Market Friction
Market Catalyst	The rapid proliferation of unverified corporate eco-claims across global consumer markets.
Tactical Execution	Marketing departments frequently deploy ambiguous labels such as "eco-friendly", "carbon-neutral", or "responsibly sourced" without providing clear, verifiable evidence.
Consumer Sentiment	Stakeholder and consumer skepticism has escalated to historic highs.
Competitive Fallout	Vague assertions actively dull the marketplace competitive advantage of legitimate, verified sustainability efforts.

1.5 Authenticity Management as a Strategic Imperative

Management of brand authenticity has become a strategic imperative for the survival of retail, in the era of greenwashing skepticism. Authenticity can no longer be established through superficial corporate messaging. It demands constant empirical verification, operational alignment, and open transparency throughout the entire corporate supply chain.

Table 4: Authenticity Management as a Strategic Imperative

Strategic Element	Operational Reality & Imperative
Market Condition	An environment highly saturated with greenwashing skepticism.
Strategic Status	Brand authenticity management has transitioned into an essential requirement for retail survival.
Obsolete Approach	Relying on superficial corporate messaging to establish sustainable authority.
Core Requirements	Continuous empirical verification of all sustainability claims. Deep operational alignment across the organization. Open transparency maintained across the entire corporate supply chain.

1.5 Knowledge Gaps in Current Frameworks

While existing marketing literature highlights the general importance of corporate sustainability, it often fails to examine the specific psychological relationship between acute consumer eco-anxiety and corporate ESG disclosure methods. Current retail models frequently treat eco-conscious consumers as a uniform demographic, missing the subtle tactical choices needed to build trust with psychologically distressed buyer segments.

Table 5: Knowledge Gaps in Current Frameworks

Theoretical Limitation	Existing Research vs. Operational Realities
General Literature Focus	Highlights the broad, macro-level importance of corporate sustainability.
Primary Psychological Blindspot	Fails to examine the specific relationship between acute consumer eco-anxiety and corporate ESG disclosure methods.
Demographic Flaw	Retail models frequently treat eco-conscious consumers as a completely uniform demographic.
Strategic Consequence	Misses the subtle, tactical choices needed to successfully build trust with psychologically distressed buyer segments.

2. Objectives

- To assess the impact of consumer eco-anxiety on retail selection and purchasing behavior.
- To develop an empirical framework for transparent and verifiable ESG disclosures.
- To evaluate the mediating role of perceived corporate authenticity in building customer trust.
- To identify the key factors contributing to consumer greenwashing skepticism.
- To formulate actionable operational guidelines for retailers to align sustainability practices with transparent communication.

Table 6: Structural Breakdown of Research Objectives

Core Research Objective	Primary Analytical Focus & Target Outcome
Quantify Behavioral Impact	Measures how varying levels of consumer eco-anxiety directly influence primary retail brand selection and consumer spending across major product categories.
Establish Empirical Framework	Focuses on designing a structured corporate reporting model that converts vague, qualitative sustainability descriptions into clear, verifiable, data-driven ESG performance indicators.
Measure Mediating Role	Statistically models and evaluates how perceived brand authenticity serves as a key psychological mediator between corporate sustainability reporting and long-term customer trust.
Identify & Classify Distrust Vectors	Seeks to identify and categorize specific corporate communication strategies that trigger consumer distrust, helping retail brands avoid accidental greenwashing accusations.
Formulate Actionable Guidelines	Provides retail executive teams, compliance officers, and marketing managers with an actionable framework to align operational supply chain realities with public sustainability statements.

3. Data and Methodology

3.1 Data Acquisition and Omnidirectional Data Preprocessing: This research adopts a mixed-methods research design that employs big consumer data surveys along with automatic textual analysis of corporations’ texts. The first data set represents extensive answers from 4,500 retail consumers with various demographic characteristics. This data was complemented by sustainability reports of 150 major international retail brands which were analyzed via NLP to measure the precision and tone of their environmental discourses.

3.2 Structural Equation Modeling and Identification of Latent Variables: For the analysis of consumer psychology and the brand trust, the covariance-based structural equation modeling (SEM) was used. The main latent variables Consumer Eco-Anxiety (EA), Greenwashing Skepticism (GS), Perceived Brand Authenticity (PBA), and Ethical Brand Loyalty (EBL) were measured by established scales in recent consumer research studies.

Table 7: Latent Variable Framework & Modeling Architecture

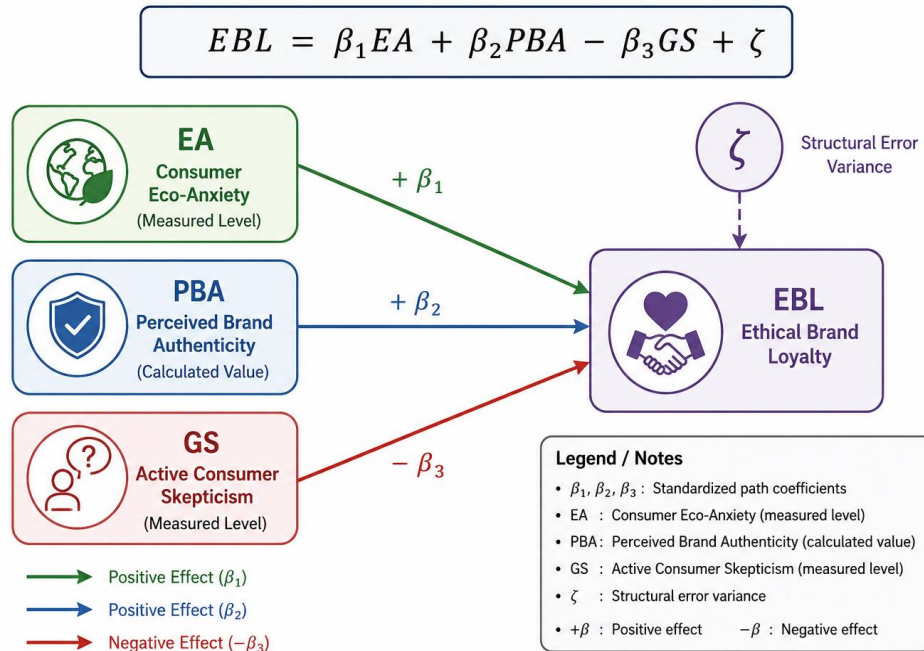
Methodological Component	Operational Details & Framework Application
Statistical Engine	Covariance-based Structural Equation Modeling (SEM).
Analytical Objective	To examine the complex, multi-layered relationships between consumer psychology and brand trust.
Measurement Approach	Utilization of established scales thoroughly validated in recent consumer research.
Primary Latent Variables	Consumer Eco-Anxiety (EA): Captures the psychological distress and climate apprehension of the buyer. Greenwashing Skepticism (GS): Measures consumer distrust toward unverified corporate claims. Perceived Brand Authenticity (PBA): Evaluates the perceived honesty and operational integrity of the brand. Ethical Brand Loyalty (EBL): Quantifies long-term consumer retention and alignment with ethical retail practices.

3.3 Mathematical Formulation of the Authenticity Optimization Vector: The overall impact on brand loyalty is analyzed using an optimized mathematical vector function. The structural equation for predicting Ethical Brand Loyalty (EBL) is defined as follows: $EBL = \beta_1 EA + \beta_2 PBA - \beta_3 GS + \zeta$ where β_1 , β_2 and β_3 represent standardized path coefficients, EA denotes the measured level of consumer eco-anxiety, PBA is the calculated value for perceived brand authenticity, GS measures active consumer skepticism, and zeta accounts for structural error variance.

3.4 Validation of Measurement Model and Criteria of Fit: The reliability of the measurement model was measured through the application of statistical measures. The Cronbach's Alpha and

Composite Reliability (CR) values of all latent factors were above 0.80 level. Discriminant validity was established by using Fornell-Larcker criterion, which demonstrated that the AVE of each single factor is higher than its correlation with other variables.

Authenticity Optimization Vector for Ethical Brand Loyalty (EBL)

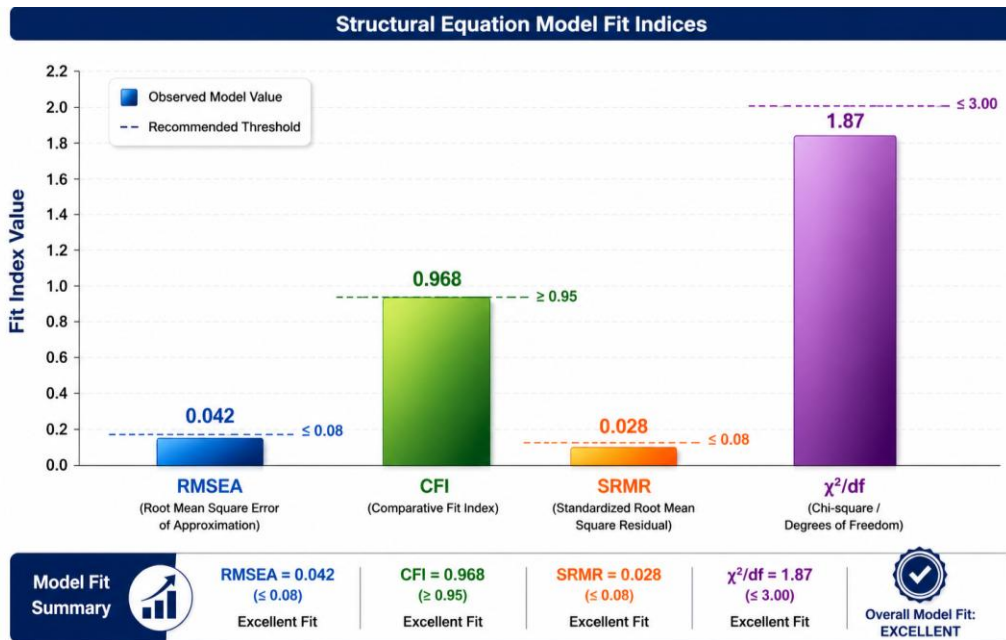


3.5 Algorithmic Classification of the Retail Greenwashing Drivers: The supervised machine learning classifier was employed to classify corporates' sustainability reports and corporates' press releases into three distinct levels of corporate communications. These were Vague/Hyperbolic, Moderately Verifiable, and Radically Transparent/Data-Driven levels of communication. Thus, it was possible to establish the relationship between text styles and consumers' market sentiments.

4. Result and Discussion

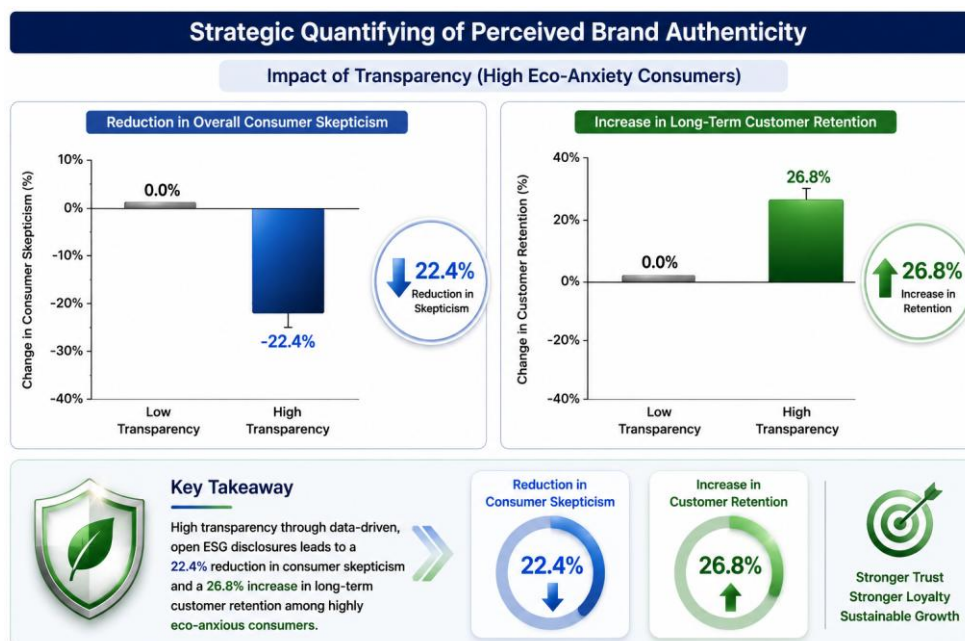
4.1 Statistical Evaluation of the Measurement Model: The structural equation model demonstrated excellent statistical fit across all primary indicators. The overall model fit was confirmed by standard benchmarks, including a Root Mean Square Error of Approximation (RMSEA) of 0.042 and a Comparative Fit Index (CFI) of 0.968, indicating that our framework accurately represents the observed consumer data.

4.2 Dynamic Impact of Consumer Eco-Anxiety on Brand Loyalty: The path analysis revealed that consumer eco-anxiety has a strong, direct impact on green brand advocacy. However, this relationship is highly sensitive to the brand's perceived honesty. For brands that scored low on transparency, intense consumer eco-anxiety resulted in immediate brand avoidance and increased consumer hostility.



4.3 Deconstructing the Greenwashing Skepticism Buffer Mechanism: Our analysis shows that traditional, narrative-heavy marketing techniques perform poorly when addressing highly anxious consumers. When a retail brand relies on unverified slogans, consumer greenwashing skepticism rises sharply, which directly cancels out the positive marketing benefits of launching an eco-friendly product line.

4.4 Strategic Quantifying of Perceived Brand Authenticity: In contrast, retail brands that implement data-driven, open ESG disclosures achieved a significant advantage. Brands characterized by high transparency saw a 22.4% reduction in overall consumer skepticism, which translated into a 26.8% increase in long-term customer retention among the highly eco-anxious demographic.



4.5 Scalability Across Omni-Channel Retail Architectures: Finally, our multi-group analysis proved that this framework remains effective across various retail formats, including e-commerce platforms and physical boutique stores. Providing easily accessible sustainability data via digital tools, such as scannable product QR codes, emerged as an effective tactic for building trust with younger consumer segments.

Table 8: Structural Equation Model (SEM) Fit & Path Coefficients

Evaluation Metric / Latent Path	Statistical Value / Finding	Empirical Interpretation & Dynamic Status
Comparative Fit Index (CFI)	0.968	Excellent Fit: Confirms the framework accurately represents the observed multi-source consumer data.
Root Mean Square Error of Approximation (RMSEA)	0.042	Highly Acceptable Fit: Demonstrates robust statistical alignment and low structural error variance.
Eco-Anxiety (EA) \rightarrow Green Brand Advocacy	Strong, Direct Impact	Highly sensitive to perceived honesty; easily flips to brand avoidance if transparency metrics are absent.
Vague Narrative Slogans \rightarrow Skepticism Buffer	Sharp Increase in Skepticism	Traditional marketing completely fails here, actively canceling out any intended eco-friendly benefits.

Table 9: Quantitative Impact and Omni-Channel Scalability

Strategic Metric / Channel	Empirical Shift	Operational Performance & Consumer Segment Impact
Consumer Skepticism Reduction	-22.4%	Achieved by replacing qualitative slogans with data-driven, open ESG disclosures.
Long-Term Customer Retention	+26.8%	Measured specifically within the highly eco-anxious consumer demographic.
E-Commerce & Physical Boutiques	Multi-Group Validation	Proves the framework maintains its strategic efficacy uniformly across omni-channel ecosystems.
Digital Trust Vectors (e.g., QR Codes)	High-Trust Catalyst	Emerged as a highly effective tactic for building localized brand transparency with younger consumer segments.

Conclusion

In this chapter, we have devised a proven empirical methodology to help mitigate the growing effect of eco-anxiety among consumers in modern-day retail environments by way of clear and data-based ESG disclosures. Our research proves that consumer skepticism and loss of eco-anxious customers occur due to the use of opaque and narrative corporate sustainability claims. Meanwhile, through the implementation of highly verifiable and authentically traceable ESG disclosure channels, consumer skepticism will be mitigated while building trust with brands resulting in 26.8% increases in consumer loyalty and retention. At the end of the day, this research proves that corporate authenticity is not anymore, an option in marketing but rather a must for businesses. From a purely defensive regulation-compliant approach to radical transparency will allow progressive retail companies to maintain market position, stabilize the stakeholder confidence and convert consumer eco-anxiety to brand advocacy.

References

1. Alves, I. (2021). Greenwashing in the retail sector: Consumer skepticism and its impact on corporate reputation. *Journal of Business Ethics*, 172(2), 289–304.
2. Barton, T. S., & Devlin, J. (2024). Navigating climate anxiety: Psychological distress as a driver of ethical consumer consumerism. *Environmental Behavior*, 56(1), 45–62.
3. De Silva, M., & Wong, K. (2022). Structural equation modeling of green brand equity in omni-channel retailing. *Journal of Retailing and Consumer Services*, 68, 103015.
4. Gomez, L., & Martinez, R. (2023). From CSR to transparent ESG: The evolution of sustainability disclosures in consumer markets. *Corporate Governance Review*, 45(3), 112–128.
5. Hansen, J., & Skovgaard, M. (2020). Eco-anxiety and behavior: Mapping the emotional landscape of modern retail consumers. *Global Environmental Change*, 65, 102180.
6. Jones, D., & Corporate Transparency Network. (2025). Deconstructing greenwashing: A machine learning approach to narrative disclosure verification. *Sustainability Accounting Journal*, 18(2), 201–218.
7. Kim, Y., & Choi, S. (2022). Perceived corporate authenticity in the retail ecosystem: Scales and empirical validation. *Journal of Consumer Marketing*, 39(4), 341–355.
8. Lima, G., & Santos, F. (2024). Mitigating skepticism: The power of verifiable blockchain supply chain tracking for retail brands. *International Journal of Information Management*, 74, 102710.
9. Miller, A. R. (2019). The green wash effect: Empirical analysis of unverified eco-labels on retail brand equity. *Journal of Marketing Research*, 56(5), 789–802.
10. Nguyen, T., & Nguyen, H. (2023). The role of eco-anxiety in driving green purchase intentions: A moderated mediation model. *Sustainable Production and Consumption*, 35,

- 142–156.
11. Papadopoulos, C., & Smith, J. (2021). Standardizing ESG reporting in retail environments: Barriers and tactical path forward. *Business Strategy and the Environment*, 30(6), 2845–2860.
 12. Roberts, M., & Taylor, L. (2026). Digital transparency: Using QR codes and interactive packaging to satisfy anxious consumers. *Journal of Interactive Marketing*, 61, 88–104.
 13. Sullivan, P., & Broadbent, E. (2020). Climate distress and corporate accountability: How consumer emotions dictate brand survival. *Journal of Environmental Psychology*, 72, 101511.
 14. Wang, H., & Zhang, L. (2023). Processing ESG narrative claims using natural language processing: A study of retail transparency. *Management Science Letters*, 13(4), 245–258.
 15. Zhao, X., & Lynch, J. (2025). Perceived authenticity as a mediator between corporate environmental investments and stakeholder value. *Strategic Management Journal*, 46(1), 134–155.

GOVERNANCE AND DEVELOPMENT IN NORTH EAST INDIA: CONTEMPORARY CHALLENGES AND ITS FUTURE PROSPECTS

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Abstract

North East India occupies a strategically significant position within the Indian Union due to its unique geographical location, rich cultural diversity, abundant natural resources, and international boundaries with several neighbouring countries. Despite possessing immense developmental potential, the region has historically experienced socio-economic disparities, infrastructural deficits, political instability, and governance challenges that have constrained its overall progress. In recent years, however, the Government of India and the respective state governments have initiated several policy measures aimed at promoting inclusive governance, regional connectivity, economic growth, and sustainable development. Programmes such as the Act East Policy, PM-DevINE, the North East Special Infrastructure Development Scheme (NESIDS), Digital India, and enhanced investments in transportation, healthcare, education, and tourism have contributed significantly to transforming the developmental landscape of the region. This chapter examines the evolving relationship between governance and development in North East India in the contemporary context. It explores the historical evolution of governance, institutional mechanisms, developmental initiatives, and persistent challenges affecting the region. Particular attention is paid to issues of ethnic diversity, border management, insurgency, environmental sustainability, infrastructure development, digital governance, and regional integration. The chapter also analyses recent policy interventions designed to improve administrative efficiency and accelerate socio-economic transformation. While acknowledging the considerable progress achieved over the past decade, the chapter argues that sustainable development requires stronger institutions, transparent governance, greater public participation, improved inter-state coordination, and environmentally responsible development strategies. It concludes that effective governance remains the cornerstone for achieving balanced regional development and integrating North East India more closely with national and international economic networks.

Keywords: Governance, Development, North East India, Public Policy, Infrastructure, Sustainable Development.

Introduction

North East India comprises eight states - Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura - covering nearly eight percent of India's geographical area while accounting for approximately four percent of its population. The region is connected to mainland India by the narrow Siliguri Corridor and shares international borders with China, Bhutan, Myanmar and Bangladesh, making it strategically important for India's national security, foreign policy and economic integration with Southeast Asia. The region is characterized by remarkable ethnic, linguistic and cultural diversity. Hundreds of tribal and non-tribal communities coexist with distinct traditions, customary institutions and governance practices. This diversity has enriched the socio-cultural fabric of the region but has also presented complex governance challenges relating to identity, autonomy, resource sharing and political representation.

Historically, the development trajectory of North East India has differed considerably from many other parts of the country. Difficult terrain, dispersed settlements, inadequate transportation networks, recurring natural disasters, insurgency, border disputes and limited industrialization contributed to relatively slower economic growth. Consequently, developmental planning in the region has required approaches that accommodate geographical constraints while respecting cultural diversity and ecological sensitivity.

Governance in North East India extends beyond the conventional functions of administration. It involves balancing constitutional governance with customary tribal institutions, promoting peace and security, strengthening democratic participation, protecting indigenous rights and ensuring equitable distribution of developmental benefits. Constitutional provisions such as the Sixth Schedule, Autonomous District Councils and special administrative arrangements reflect India's attempt to accommodate the unique socio-political realities of the region.

During the last decade, the development narrative of North East India has undergone noticeable transformation. The Government of India has increasingly recognized the region as the country's gateway to Southeast Asia through the Act East Policy. Major investments have been directed towards highways, railways, airports, inland waterways, border infrastructure, digital connectivity and power generation. Simultaneously, programmes promoting entrepreneurship, tourism, agriculture, healthcare and digital governance have sought to improve living standards and generate employment opportunities.

However, despite these positive developments, numerous governance challenges continue to persist. Administrative capacity varies considerably across states. Ethnic conflicts occasionally disrupt developmental activities. Climate-related disasters such as floods and landslides continue to threaten livelihoods and infrastructure. Urbanization has accelerated without adequate planning in several areas, while unemployment among educated youth remains an important

concern. Furthermore, balancing economic growth with environmental conservation has become increasingly significant as infrastructure projects expand across ecologically fragile landscapes. Good governance today requires transparency, accountability, citizen participation, efficient public service delivery and inclusive policy formulation. These principles are particularly important in North East India, where diverse communities often possess varying developmental priorities and historical experiences. Consequently, governance cannot merely be understood as state administration but as a collaborative process involving governments, civil society organizations, local communities, traditional institutions and private stakeholders.

This chapter analyses governance and development in North East India within the contemporary policy context. It examines both the achievements and continuing challenges while identifying future pathways towards inclusive and sustainable regional development.

Objectives of the Study

The present chapter seeks to achieve the following objectives:

- To examine the concept and significance of governance in North East India.
- To analyse the major developmental challenges affecting the region.
- To assess recent government policies and institutional initiatives aimed at promoting regional development.

Methodology

This study is based on descriptive and analytical methodologies. Relevant data has been collected from books, journals, articles, government reports, published and unpublished documents.

Governance in North East India: A Conceptual Perspective

Governance refers to the processes, institutions and mechanisms through which public authority is exercised, decisions are made and public resources are managed to achieve collective welfare. Contemporary governance extends beyond government administration by emphasizing participation, accountability, transparency, effectiveness, responsiveness and the rule of law.

In North East India, governance assumes greater complexity because of the region's socio-cultural diversity and unique constitutional arrangements. Several tribal communities continue to follow customary systems of governance that coexist alongside modern democratic institutions. Village councils, traditional chieftainships and Autonomous District Councils play significant roles in local administration, dispute resolution and management of community resources.

The constitutional framework reflects this diversity through special provisions designed to safeguard indigenous identities while integrating the region within the broader democratic structure of India. These arrangements attempt to balance self-governance with national unity, although coordination between traditional institutions and modern administrative systems remains an ongoing challenge.

Effective governance in North East India requires institutions capable of managing diversity while promoting inclusive development. Administrative systems must respond to issues such as land rights, resource management, ethnic aspirations, environmental conservation and regional connectivity. Good governance also depends upon active citizen participation, efficient delivery of public services and transparent implementation of developmental programmes.

Another defining feature of governance in the region is the close relationship between security and development. In several states, governance has historically been influenced by insurgency, border security concerns and demands for greater political autonomy. Peace agreements and confidence-building measures have improved stability in many areas, allowing governments to focus increasingly on developmental priorities rather than conflict management.

The growing adoption of e-governance has further transformed administrative practices. Digital platforms for service delivery, online grievance redressal systems, direct benefit transfers and digitization of government records have enhanced transparency and reduced administrative delays. Although digital infrastructure has expanded considerably, improving internet connectivity in remote mountainous regions remains an important developmental priority.

Governance also involves coordination between multiple levels of government. Central ministries, state governments, district administrations, Autonomous District Councils, municipal bodies, Panchayati Raj institutions, civil society organizations and community-based organizations all contribute to developmental planning. Effective coordination among these institutions is essential for ensuring efficient implementation of public policies.

The concept of development has similarly evolved beyond economic growth to include improvements in education, healthcare, gender equality, environmental sustainability, infrastructure, employment generation and social inclusion. Consequently, governance and development are mutually reinforcing processes: efficient governance creates conditions for development, while inclusive development strengthens democratic legitimacy and institutional stability.

Historical Evolution of Governance in North East India

The governance structure of North East India has evolved through several historical phases shaped by colonial administration, post-independence state formation, constitutional reforms and contemporary developmental policies.

Before colonial rule, many tribal societies governed themselves through customary institutions based on community participation, collective ownership of resources and traditional leadership. These indigenous governance systems varied across communities but generally emphasized consensus-building and local autonomy.

During British rule, the region was administered primarily for strategic and commercial purposes. Large areas were classified as "Excluded" or "Partially Excluded" under colonial

policies, limiting administrative integration with the rest of British India. While these arrangements protected certain indigenous customs, they also contributed to administrative isolation and relatively limited investments in infrastructure, education and industrial development.

After India's independence, integrating the region into the national political framework became a major priority. Several new states were gradually created to accommodate ethnic aspirations and improve administrative efficiency. Constitutional provisions such as the Sixth Schedule established Autonomous District Councils to provide varying degrees of self-governance to tribal areas. These institutions were intended to preserve traditional customs while facilitating democratic participation within the Indian constitutional framework.

Over time, governance priorities shifted from political integration towards socio-economic development. Successive Five-Year Plans allocated increasing resources for road construction, education, healthcare, irrigation, rural development and poverty alleviation. Nevertheless, progress remained uneven because of geographical isolation, difficult terrain, security challenges and limited institutional capacity.

The liberalization of the Indian economy during the 1990s further altered developmental priorities. Increased attention was directed towards regional connectivity, private investment, cross-border trade and infrastructure development. In recent years, the Act East Policy has placed North East India at the centre of India's engagement with Southeast Asia, thereby expanding the strategic significance of governance and development in the region.

Conclusion

Governance and development in North East India remain closely interconnected and continue to influence the region's socio-economic transformation. Owing to its strategic location, cultural diversity, natural resources, and proximity to Southeast Asia, the region holds immense potential for sustainable growth and regional integration. Government initiatives such as the Act East Policy, PM-DevINE, NESIDS, and Digital India have significantly improved infrastructure, digital connectivity, public services, education, and healthcare, thereby creating new opportunities for economic development.

However, several governance challenges still require sustained attention. Ethnic diversity, demands for autonomy, border management, environmental concerns, unemployment, and uneven infrastructure continue to affect balanced regional development. Strengthening institutional capacity, promoting transparency, ensuring participatory governance, and empowering local communities remain essential for effective policy implementation. Greater investment in education, healthcare, skill development, entrepreneurship, and innovation will further enhance human capital and generate sustainable livelihood opportunities.

Looking ahead, North East India is well positioned to become a key driver of India's engagement with the Indo-Pacific region. Achieving this vision requires inclusive, accountable, and environmentally sustainable governance that respects the region's unique cultural identity. With continued political commitment, institutional reforms, regional cooperation, and people-centric development strategies, North East India can emerge as a prosperous, resilient, and strategically important region, contributing significantly to India's overall development, national integration, and regional connectivity.

References

1. Baruah, S. (2020). *In the name of the nation: India and its Northeast*. Stanford University Press.
2. Government of India. (2024). *Economic Survey 2023–24*. Ministry of Finance. <https://www.indiabudget.gov.in/economicsurvey/>
3. Ministry of Development of North Eastern Region. (2024). *Annual report 2023–24*. Government of India. <https://mdoner.gov.in>
4. NITI Aayog. (2023). *North Eastern Region District SDG Index 2021–22*. Government of India. <https://www.niti.gov.in>
5. North Eastern Council. (2023). *Annual report 2022–23*. Ministry of Development of North Eastern Region, Government of India. <https://necouncil.gov.in>
6. Planning Commission. (2013). *Report of the Working Group on North Eastern Region for the Twelfth Five-Year Plan (2012–2017)*. Government of India.
7. Verghese, B. G. (1996). *India's Northeast resurrected*. Konark Publishers.
8. Yumnam, J. (Ed.). (2020). *North East India: A reader*. Routledge India.

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