

An Empirical Study of the Role of Generative Artificial Intelligence (Gen AI) Applications in Enhancing Employee Productivity during Digital Transformation in Indian Private Sector Organizations

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Abstract

This empirical study examines the impact of Generative Artificial Intelligence (Gen AI) on employee productivity during digital transformation efforts in Indian private-sector organizations. The research employed a mixed-methods approach, gathering data from 301 survey participants and conducting in-depth interviews with 40 professionals to evaluate the impact, adoption factors, and challenges of deploying Gen AI. Research indicates that Generative AI markedly enhances productivity via task automation, increased creativity, and expedited information retrieval. Primary factors influencing adoption encompassed user-friendliness, accessibility of training, and performance-based incentives, whereas organizational vision and leadership endorsement were essential facilitators. While digital literacy positively impacted AI adoption, moderation analysis revealed it did not significantly affect the AI-productivity relationship, indicating that other contextual factors—such as organizational culture and leadership involvement—may be more critical. Qualitative insights identified obstacles, including data privacy concerns, biases in AI-generated content, employee opposition, and integration complexities. Strategies such as transparent communication, phased implementation, and strong data governance have proven effective mitigation practices. Employees conveyed enthusiasm and apprehension concerning Gen AI, indicating heightened engagement and opportunities for skill enhancement, while harboring concerns about job displacement and reliance on AI. The study's ramifications encompass practice, policy, and theory. It advocates for role-specific training, internal governance structures, and the cultivation of an innovative culture to facilitate effective AI implementation. Policy recommendations encompass establishing regulatory clarity, promoting ethical AI utilization, and strengthening public-private collaborations for AI literacy. Theoretically, this study enhances the literature by contesting the notion of digital literacy as an independent facilitator of productivity and highlighting the significance of organizational preparedness.

Keywords: *Generative Artificial Intelligence, Employee Productivity, Digital Transformation, Digital Literacy, Indian Private Sector.*

1. Introduction

Digital transformation refers to the adoption of advanced technologies such as artificial intelligence (AI), cloud computing, big data, IoT, and blockchain to redesign business processes, enhance efficiency, and drive innovation. In India, initiatives like *Digital India*, improved Internet connectivity, and affordable digital tools have accelerated this transformation in the private sector. Employee productivity is crucial for enhancing the quality, performance, and profitability. However, the relationship between digital transformation and productivity remains underexplored, with existing studies offering mixed results.

This study aims to examine the impact of digital transformation and generative AI (Gen AI) on employee productivity in India's private sector. It seeks to provide insights for managers and policymakers to develop effective digital strategies, supportive workplace cultures, and skill development programs. The findings will help organizations enhance productivity and achieve sustainable growth in the evolving digital era.

1.1 Research Objectives

Quantitative-Based Research Objectives

- RO1: To understand how generative AI applications can boost employee productivity during the digital transformation of Indian private sector organizations.
- RO2: To identify the key factors that make generative AI applications effective in helping employees work more efficiently in these organizations.
- RO3: To explore whether employees' digital skills affect the success of generative AI in improving productivity.

Qualitative-Based Research Objectives

RO4: To investigate the challenges companies face when integrating generative AI into their daily operations during digital transformation.

RO5: To find out how generative AI impacts employee satisfaction and engagement, especially in digital transformation.

1.2 Research Questions

Quantitative-Based Research Question

Research Question 1: How do generative AI applications impact employee productivity during digital transformation in Indian private sector organizations?

Research Question 2: What are the key factors influencing the adoption of generative AI applications in enhancing employee productivity in these organizations?

Research Question 3: Does the level of employee digital literacy moderate the relationship between the use of generative AI applications and productivity?

Qualitative-Based Research Question

Research Question 4: What are the potential challenges and barriers that organizations face while integrating generative AI applications into their workflows?

Research Question 5: How do generative AI applications affect employee job satisfaction and engagement in the context of digital transformation?

1.3 Research Hypothesis

H_{a1}: The adoption of generative AI applications has a significant positive impact on employee productivity during digital transformation in Indian private sector organizations.

H_{a2}: Employee digital literacy moderates the relationship between the use of generative AI applications and employee productivity, such that higher levels of digital literacy strengthen the positive relationship.

H_{a3}: Organizations that integrate generative AI applications face fewer operational challenges compared to those that rely solely on traditional digital tools during digital transformation.

2. Review of Literature (Linked to RQs)

Research Question	Key Themes	Supporting Literature	Key Insights
RQ1: How do generative AI applications impact employee productivity during digital transformation in Indian private sector organizations?	AI's Role in Workplace Productivity	Tarafdar, Beath, & Ross (2019) and others	AI-driven automation reduces task overload and improves productivity by allowing focus on strategic tasks.
	AI in Digital Transformation	Vial (2019); NASSCOM (2023) and more	AI enables restructuring of workflows and enhances productivity through content generation and automation.
RQ2: What are the key factors influencing the adoption of generative AI applications in enhancing employee productivity in these organizations?	Organizational Readiness	Davenport & Ronanki (2018)	Digital infrastructure and alignment with goals are essential for AI adoption.
	Technological Infrastructure	Bessen et al. (2020)	Data quality and robust tech infrastructure drive AI adoption success.
	Employee Skill Levels	Rai et al. (2020)	AI upskilling is critical to maximize productivity gains.

Research Question	Key Themes	Supporting Literature	Key Insights
	AI Governance and Ethics	Gursoy et al. (2021)	Clear AI governance structures ensure responsible adoption, enhancing productivity.
RQ3: Does the level of employee digital literacy moderate the relationship between the use of generative AI applications and productivity?	Digital Literacy as a Moderator	van Laar et al. (2017)	Higher digital literacy enables employees to fully leverage AI tools.
	Human-AI Collaboration	Jarrahi (2018)	Collaboration between humans and AI enhances workflow efficiency.
	Employee Digital Competence	Petter et al. (2020)	Competence in digital tools moderates the impact of AI on productivity.
RQ4: What are the potential challenges and barriers that organizations face while integrating generative AI applications into their workflows?	Technical and Infrastructure Challenges	Dwivedi et al. (2021)	Outdated infrastructure and data systems are major barriers to AI integration.
	Workforce Resistance	Wamba et al. (2020)	Employees fear job loss and lack skills, leading to resistance.
	Ethical Concerns	Jobin et al. (2019)	Data privacy and ethical issues hinder AI adoption.
	Cost Constraints	Kaplan & Haenlein (2020)	High initial and ongoing costs pose barriers to AI adoption.
RQ5: How do generative AI applications affect employee job satisfaction and engagement in the context of digital transformation?	AI-Driven Job Design	Brougham & Haar (2018)	AI automates routine tasks, enabling employees to focus on meaningful work, increasing job satisfaction.
	Employee Engagement	KPMG (2020)	AI allows employees to focus on creative tasks, boosting engagement.
	Employee Autonomy	Lepak & Snell (2020)	AI increases employee autonomy, allowing independent work and higher satisfaction.
	Stress Levels	Tarafdar et al. (2019)	AI reduces task stress but can introduce upskilling pressure.

3. Research Design & Methods

An investigation is being carried out within a mixed-methods research design. The study is grounded in a pragmatic paradigm. In addition, the study employs both quantitative and qualitative research methods. The quantitative phase uses a deductive approach to test hypotheses derived from a theory, using survey data from 301 respondents. The qualitative phase, adopting an inductive approach, allows for gaining insights and patterns via in-depth interviews of 40 respondents. Data collection was conducted from employees and managers of the private-sector organization across different industries, sizes, and regions of India, using a stratified random sampling method. By triangulating the data, the validity, reliability, and contextualization of the findings can be improved.

4. Data Analysis

4.1 Analysis of Research Question 1

Table 4.1: Correlation

		Familiarity with Generative Applications	Generative AI Improved Productivity
Spearman's rho	Familiarity with Generative Applications	Correlation Coefficient	1.000
		Sig. (2-tailed)	.162**
		N	.005
	Generative AI Improved Productivity	Correlation Coefficient	301
		Sig. (2-tailed)	301
		N	.162**

** . Correlation is significant at the 0.01 level (2-tailed).

The value 0.162 indicates a weak but positive relationship between familiarity with Generative AI and perceived productivity improvement. While employees who are more familiar with AI tend to report higher productivity, the small effect size suggests that other factors, such as organizational support, AI integration strategies, and digital literacy, play a more crucial role in determining productivity outcomes. This implies that simply being familiar with AI is not enough.

4.2 Analysis of Research Question 2

Based on the frequency analysis, ease of use, organizational support, leadership, incentives, training, and cultural alignment are key factors influencing the successful adoption of Generative AI to enhance employee productivity. For maximum impact, organizations should focus on simplifying AI tools, investing in training, fostering leadership commitment, and creating a culture that rewards AI adoption.

4.3 Analysis of Research Questions 3

Table 4.2: Regression

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.267 ^a	.071	.062	1.262

a. Predictors: (Constant), AI_Literacy_Interaction, Need for Additional Training on Generative AI, Higher Digital Literacy Benefits

ANOVA^a

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	36.341	3	12.114	7.603	.000 ^b
	Residual	473.180	297	1.593		
	Total	509.522	300			

a. Dependent Variable: Extent Digital Skills Help AI Usage

b. Predictors: (Constant), AI_Literacy_Interaction, Need for Additional Training on Generative AI, Higher Digital Literacy Benefits

The model indicates that the model is significant; $F(3,297) = 7.603$ $p < 0.001$. However, the model explains only 7.1% of the variance in AI adoption, indicating that other moderating factors exist. Employees who recognize the benefits of digital literacy are likely to adopt Generative AI, as it plays a crucial role in their professional development ($B = 0.201$, $p = 0.022$). The ANOVA result ($F = 7.603$, $p < .001$) indicates that AI literacy, interaction, and training needs significantly influence how digital skills enhance AI usage.

4.4 Qualitative Analysis (Data Analysis RQ4)

Research Question 4: What are the potential challenges and barriers that organizations face while integrating generative AI applications into their workflows?

This thematic analysis highlights the major challenges in generative AI adoption, ongoing barriers, and industry-specific constraints. Addressing these concerns through structured implementation strategies, robust governance, and targeted training can improve AI integration within organizations.

Table 4.3: Thematic Analysis I

IQ1: Challenges in Integrating Generative AI	IQ2: Organizational Support for AI Integration	IQ3: Ongoing Barriers in Using Generative AI	IQ4: Industry-specific Challenges in AI Adoption
<ul style="list-style-type: none"> • Bias & Ethical Concerns • Cost & Resource Constraints • Data Privacy & Security • Employee Resistance • Integration Complexity • Quality & Accuracy Issues 	<ul style="list-style-type: none"> • Cross-functional Collaboration • Enhanced Data Governance • Gradual Implementation Strategy • Robust Change Management • Transparent Communication 	<ul style="list-style-type: none"> • Accuracy & Reliability Issues • Data Security Concerns • Ethical & Bias Concerns • Integration Challenges • Lack of AI Literacy • Limited Customization 	<ul style="list-style-type: none"> • Data Sensitivity & Confidentiality • High Accuracy Requirements • Intellectual Property Risks • Lack of Industry-Specific AI Models • Regulatory & Compliance Constraints • Workforce Adaptability

4.5 Qualitative Analysis (Data Analysis RQ5)

Research Question 5: How does the use of generative AI impact job satisfaction and engagement?

This thematic analysis highlights how generative AI is impacting job satisfaction, employee engagement, the evolution of work, and digital transformation. According to the survey findings, concerns can be addressed using structured implementation and training to improve AI adoption in the workplace.

Table 4.4: Thematic Analysis II

IQ5: Impact on Job Satisfaction	IQ6: Impact on Work Engagement	IQ7: Change in Nature of Work	IQ8: Engagement in Digital Transformation
<ul style="list-style-type: none"> • Faster task completion & automation improve workflow efficiency. • Upskilling & new learning opportunities enhance career growth. • AI-assisted creativity boosts engagement & satisfaction. 	<ul style="list-style-type: none"> • AI-driven insights encourage adaptability & skill growth. • Some employees feel empowered; others uncertain about AI's long-term role. • AI inaccuracies cause frustration & reliance on human oversight. • AI reshapes responsibilities, requiring flexibility. 	<ul style="list-style-type: none"> • New responsibilities for ethical AI monitoring. • Workflows now rely on AI-generated content validation. • Shift to AI-assisted roles, requiring reskilling. 	<ul style="list-style-type: none"> • AI exposure increases enthusiasm for digital change. • Lack of AI knowledge lowers confidence & engagement. • Learning AI improves adaptability & growth. • Clear AI communication strengthens trust.

IQ5: Impact on Job Satisfaction	IQ6: Impact on Work Engagement	IQ7: Change in Nature of Work	IQ8: Engagement in Digital Transformation
<ul style="list-style-type: none"> • Handling routine tasks allows focus on strategic work. • Concerns: AI errors, job anxiety, and reduced human involvement. 	<ul style="list-style-type: none"> • Improves teamwork, brainstorming & creative workflows. 	<ul style="list-style-type: none"> • AI reduces repetitive effort & accelerates decision-making. • AI boosts ideation, content generation & analysis. 	<ul style="list-style-type: none"> • Streamlined tasks enhance participation. • Concerns: fear of automation reducing roles.

5. Implications for Stakeholders

- Leaders should create a clear AI strategy, align it with organizational goals, empower teams, encourage innovation, and balance ethics with efficiency.
- HR & L&D must provide hands-on Gen AI training, foster human-AI collaboration, and promote continuous learning to boost engagement and retention.
- IT & Innovation Teams need to ensure AI compatibility, implement strong security and monitoring, and collaborate with business units for customized solutions using agile methods.
- Policymakers should develop industry-specific regulations, ensure ethical AI use, clarify IP rights, promote transparency, and support AI adoption through literacy programs and incentives.
- Employees should engage in continuous learning, upskill for AI, participate actively in AI implementation, and adapt to evolving job roles to stay productive, empowered, and future-ready.

6. Recommendations

- Provide role-specific AI training with simulations, real-time applications, and micro-credentials to support career development.
- Encourage adoption through incentives, gamification, peer learning, and AI ambassador programs.
- Implement internal governance frameworks, bias audits, explainable AI, and strong cybersecurity for ethical and secure AI use.
- Use phased integration and agile deployment with pilot projects, feedback loops, and iterative improvements.
- Foster a culture of innovation, transparency, and employee involvement in AI strategy, linking adoption to organizational KPIs.
- Collaborate with external experts, startups, and academic institutions to share knowledge, explore emerging use cases, and enhance skills.

7. Limitations of the Study

- The study included 301 employees from India's private sector but did not fully represent all industries, particularly manufacturing, logistics, and agriculture, where AI adoption levels differ.
- The data relied on self-assessments of digital literacy, AI familiarity, and productivity, which may include biases or inaccuracies.
- The study captures a single moment in time and does not reflect long-term changes in AI's impact on productivity and engagement.
- Only 40 participants were interviewed, providing rich but limited insights that cannot be generalized across all organizations.
- The rapid evolution of Generative AI may quickly render the study's findings outdated as new tools, technologies, and regulations emerge.

8. Future Study

- Future studies should adopt longitudinal designs to track the long-term impact of Generative AI on job satisfaction, productivity, engagement, and organizational performance, capturing how employee perceptions and outcomes evolve over time.
- Research should focus on industry-specific contexts, such as manufacturing, logistics, agriculture, and construction, to uncover unique challenges, safety considerations, and operational efficiencies shaped by AI adoption.

- Cross-cultural comparisons across countries, regions, and urban-rural tiers in India can reveal how cultural attitudes, regulations, education, and trust influence AI adoption and inform global yet locally adapted transformation frameworks.
- In-depth moderation analyses should examine factors like digital literacy, organizational culture, leadership support, trust, job complexity, and fairness perceptions, using methods such as SEM and multi-level modeling to understand nuanced relationships.
- Studies should investigate AI governance models, including ethics committees, bias audits, explainability standards, accountability frameworks, and data privacy measures, evaluating alignment with employee values, regulations, and customer trust.
- Overall, future research should adopt an interdisciplinary approach addressing organizational, social, psychological, and technical interactions to inform evidence-based policies, corporate strategies, and ethically aligned AI systems.

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