(REVIEW ARTICLE)

Understanding employee experiences with technology integration in Indian industries: A qualitative study

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Abstract

The study explores the influence of technology utilization in the working lives of employees within Indian industries and considers the difficulties, ways, and recommendations that such a thing demands. It utilizes a qualitative research method approach to figure out the role of employees in the process of technology integration. Thematic analysis operates by detecting the prevalent motifs and ideas in the interview data, which gives an insight into the effects of technology on employee experiences. The sample distribution of the strategic defensive PSU in KGF, Karnataka, India includes representatives of skilled workers, unskilled workers and employees from the HR department. The results underline the integration of technology, adaptation strategies for employees, and challenges faced by employees, as well as things the HR professionals and organizations may need to consider in dealing with the technology. The research paper articulates this fact by calling for the combination of inclusive diversity programs, transparent leadership, and continuous learning processes to achieve the desired outcome of managing employee welfare and inequality in the digital age.

1. Introduction

Technology has gained enormous significance in our modern lives, allowing a giant range of activities from communication to industry. In India, the incorporation of technology into the industrial method has become the norm, as it was pushed by the pursuit of more productivity advancement. Nevertheless, a complex situation appears for companies and their workers due to the depths of the integration. The one major obstacle is the fear caused by technological progress, and this leads the workers, especially the older ones, to reject new advancements. This resistance in the adoption of new technology can prevent its smooth adoption in IT implementation, making the situation worse by the differences between older and newer IT systems. Conditionally, through the forwarding of solutions like comprehensive testing and secure data migration, a solution can be achieved to overcome these barriers too [1,14].

Along with conventional jobs being disrupted by technology, Human Resources departments, especially the top-level positions, may be getting apart from the workers. Engaging employees in decision-making and creating an environment of makes the transition process seem familiar allows them to control the risks [4].

Though these difficulties are not unsurmountable, the plethora of opportunities that technologies such as Artificial intelligence, big data, and cloud computing have to offer promise futuristic and innovative growth in all organizations. Achieving success in technology integration calls for a workforce with innovative skills and comprises people with a culture that embraces learning. The understanding of technological implications for employees is crucial as it touches

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upon job satisfaction, skill development and overall wellness. To settle these problems organizations, need to expand a learning culture and fill the gap between organization development and innovations in technology [5,2].

In a nutshell, this research intends to add to the body of work about technology usage integration in Indian industries through the exploration of the experiences and challenges of employees. The objective of the study is to pinpoint the most efficient strategies for technology implementation and advance the effort to make the workforce more adaptable to the changing environment. The study anticipates that it will facilitate coordination between various parties to ensure that the world is a better place, where everyone's comfort matters.

1.1. Technology Integration and its Developments

Technology integration known by the use of electronic equipment and computer-based networks in operating business operations and to maximize efficiency and effectiveness, is used in many sectors. The latest breakthroughs in industries like the automobile sector call into consideration bringing about many AI-triggered innovations. The works of [9,10] spotlight AI as the leading technology benchmark among all automotive companies. This technology has been embraced widely in automobiles by Tesla in particular as it empowers them with enhanced safety and efficiency and makes them competitive. Furthermore, [12] investigates the use of AI-enabled industrial robots in auto-component manufacturing firms in India, thus furnishing some insights into the involvement of a wide range of factors behind the technology adoption decisions. [13] may shed light on the labour conditions related to micro-tasks in AI manufacturing processes. They exist thanks to the labour-intensive activities involved in AI fabrication. On the other hand, [3] conducted balanced research that covered job automation in several OECD countries and countered the conventional notion of massive job cuts by stressing the necessity of a comprehensive response to the AI integration effects on the job market.

1.2. Employee Experiences with Technology Integration in Different Sectors

The employee experience incorporates perspectives, emotions, and encounters within the organization, including the influence of new technology introduction on organizational dynamics. Studies by [11] focus on the role of AI adoption in developing skills for workers and managing employment relations, showing the way for workers to attain these skills through the reallocation of tasks and HR strategies. AI usage in HR Management is discussed in the paper by [8] and its impact on customized interventions and minimization of biases is highlighted by [6] for instance, prioritizing reskilling employees to meet the technical disruptions, especially in the MNCs is important. Moreover, [7], who focused on AI and robotics and their effects on future job opportunities emphasize that the use of AI will create new job opportunities as well as reduce human efforts thus necessitating the need to make proactive policies that address these areas of AI. Apart from that, [15] discusses AI's influence on employee engagement, stating that your employees should be active and passionate about their jobs for your organization to be successful.

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2. Material and Method

2.1. Research Design

Qualitative research design was used in this study. This study is non-experimental research that helps in finding the employee experiences with technology integration in Indian industries. Qualitative research comprises gathering and analyzing non-numerical data (e.g., text, video, or audio) to comprehend concepts, opinions, or experiences. It can be used to get detailed insights into a topic or to generate new research ideas.

2.2. Concepts

2.2.1. Technology Integration in the Indian Industry

Technology integration refers to the industry set-up to adopt the rapid incorporation of technology solutions and systems across industries, including manufacturing, services, and agriculture, to better efficiency, productivity, and competitiveness. It is doing this through the availability and incorporation of digital tools, automation, Internet of Things (IoT) devices, artificial intelligence (AI), and other new and innovative technologies to help in process optimization, and operations minimization and to enhance business growth. The technology-enabled approach entails the evaluation of existing as well as the introduction of new technologies and their streamlining and digitizing across sectors so that industries can establish themselves efficiently in the digital age. Technology integration in the Indian industry is known to involve the application of modern technologies to solve specific industry problems, save resources for optimal utilization and make the most out of emerging market opportunities both globally and regionally.

2.2.2. Employee Experiences

The concept of employee experiences stands for the subjective perception, feelings and contacts of the employees with the working environment, except technical integration and employee transformation. It consists of the different sides of employee engagement, happiness, health, and productivity, and various elements like communication, training, support, and the culture of the organization affect them. From the employee perspective, the practical side of the involvement in implementing the changes both positive and negative experience can be described, which includes among other things challenges faced, opportunities for growth, the levels of autonomy, and the impact of technology adoption on job roles and work dynamics. Improving the employee experience is a baseline for the success of change management, boosting employee resilience, and establishing a workplace culture where technological change and transformation are being supported.

2.2.3. Rationale for the Study

This study explores the dynamic interplay between Technology integration and Employee experiences, within the industry. By examining the challenges and opportunities arising from technology integration, it aims to contribute valuable insights that can influence HR strategies, organizational policies, and employee development initiatives. Ultimately, this research seeks to enhance our understanding of technology's integration impact on employee experiences in one of the strategic defence PSUs located in KGF, Karnataka.

2.2.4. Sample Distribution and Technique

The participants of the study were from a strategic defence PSU falling under the geographical area of KGF, Karnataka, India. The sample size for the study was 25 out of which 10 were skilled workers, 10 were unskilled workers and 5 employees from the HR department. The participants were chosen from 2 different divisions of the industry i.e. Hydraulics and powerline division.

A combination of purposive sampling and snowball sampling techniques was used to select employees for participation in the research study.

Purposive Sampling - This technique involves selecting participants based on specific criteria relevant to the research objectives. In this study, employees who have experience with technology integration in the organization were purposefully selected to ensure that the sample represents a diverse range of perspectives and experiences related to the research concepts.

Snowball Sampling - Once initial participants are identified through purposive sampling, the snowball sampling technique can be employed to expand the sample size. Participants were asked to refer other employees within the organization who meet the inclusion criteria and have valuable insights to contribute to the study. This approach helped in identifying additional participants who may not have been initially accessible through purposive sampling alone, thus enriching the diversity of perspectives within the sample.

2.3. Data Collection

Qualitative data was collected through in-depth interviews. Open-ended questions were used to encourage participants to share their insights and experiences regarding technology and workforce adaptation. Interviews were conducted in person and responses were noted in written form as recording devices were not allowed inside the industry. The non-verbal cues were also noted down.

2.4. Data Analysis

The thematic analysis was employed to identify recurring themes and patterns in the interview data. This process involved coding, categorizing, and interpreting the qualitative data to derive meaningful insights. Thematic analysis was well-suited for exploratory research, which is often the case when studying emerging phenomena like the impact of technology on workforce adaptation. The study uncovers and explores patterns, themes, and insights that may not be predefined, providing a flexible approach to data analysis.

2.5. Ethical Considerations

Participants were provided with detailed information about the nature of the study, potential risks, benefits, and their right to decline or withdraw from participation. Informed consent was obtained from each participant before data collection, ensuring they fully understood and agreed to participate voluntarily. Throughout the research process,

utmost honesty and integrity were maintained in reporting the results, with strict adherence to avoiding plagiarism or duplicate publication of data.

3. Results

Table 1 Theme 1 along with its sub-themes and statement of evidence obtained through thematic analysis

Theme	Sub-themes	Statement of Evidence
Technology Integration		"At the workshop, technology integration is a key priority to enhance operational efficiency and competitiveness." - HR Manager
	Adoption of Advanced Equipment and Systems	"Our organization has embraced technology, incorporating CNC machines and automated assembly lines..." (Production Engineer)
	Implementation of Control Systems	"The organization has embraced advanced control algorithms, machine learning techniques, and predictive analytics..." (Control System Specialist)
	Integration of Instrumentation Systems	"Our division incorporates cutting-edge instrumentation technologies, such as smart sensors, wireless communication, and remote monitoring solutions..." (Instrumentation Engineer)
	Use of Machinery and Equipment	"We have electric drills, hydraulic lifts, and other tools that make our work easier." (Worker 1)

Table 2 Theme 2 along with its sub-themes and statement of evidence obtained through thematic analysis

Theme	Sub-themes	Statement of Evidence
Challenges Faced by Employees		"Adapting to new interfaces and technology updates poses a challenge..." (Production Engineer)
	Skill Gaps in Troubleshooting Complex Systems	"Employees often encounter challenges in troubleshooting and maintaining sophisticated equipment..." (Senior Technician)
	Resistance to Change	"Technology integration can disrupt traditional maintenance workflows and require employees to adapt to new processes and tools..." (Maintenance Supervisor)
	Learning to Operate Machinery and Equipment	"One of the challenges we face is learning to operate new machinery and equipment." (Worker 1)
	Adapting to Changes	"Adapting to changes in technology can be difficult for us, especially if we're used to doing things a certain way." (Worker 5)

Table 3 Theme 3 along with its sub-themes and statement of evidence obtained through thematic analysis

Theme	Sub-themes	Statement of Evidence
Workforce Adaptation Strategies		"Our organization fosters a culture of innovation and continuous improvement, encouraging employees to embrace new technologies..." (Electrical Engineer)
	Hands-on Training and Practical Experience	"Our organization provides ample opportunities for hands-on training and practical experience with new technologies..." (Senior Technician)
	Phased Approach to Change Management	"We adopt a phased approach to technology adoption, gradually introducing new tools and systems while providing adequate training and support to employees..." (Maintenance Supervisor)
	Supportive Environment	"Our organization fosters a supportive environment where employees feel empowered to experiment with new technologies and take calculated risks..." (Instrumentation Engineer)
	Diversified Skill Development and Versatile Workforce	"Rotating tasks and providing opportunities for cross-training can expose us to different aspects of the job and broaden our skill set." (Worker 2)

Table 4 Theme 4 along with its sub-themes and statement of evidence obtained through thematic analysis

Theme	Sub-themes	Statement of Evidence
Recommendations for HR Professionals and Organizations		"HR professionals should proactively assess future skill requirements and develop targeted talent management strategies." - HR Manager
	Employee Development and Skill Enhancement	"HR professionals should prioritize employee development and skill enhancement initiatives to equip employees with the necessary competencies..." (Electrical Engineer)
	Culture of Continuous Learning	"Organizations should foster a culture of continuous learning, collaboration, and innovation to empower employees to adapt to technological changes..." (Senior Technician)
	Tailored Training and Development Programs	"HR professionals should partner with business leaders and technology experts to design tailored training and development programs..." (Control System Specialist)
	Support for Change Management	"Change management strategies should focus on creating a supportive environment where employees feel valued, heard, and empowered to embrace change..." (Maintenance Supervisor)

4. Discussion

The discussion zooms in on the significance of each theme, analyzing them in terms of theory, practice, or policy. Moreover, unanticipated or conflicting outcomes are covered, offering exciting avenues for further investigation and research.

4.1. Technology Integration

The theme of Technology Integration within the strategic defence PSU encompasses various sub-themes that collectively highlight the organization's commitment to embracing cutting-edge technologies and leveraging them to enhance operational efficiency, safety, and productivity. Firstly, the sub-theme of the Adoption of Advanced Equipment and Systems underscores the organization's proactive approach to integrating state-of-the-art machinery and automated systems into its production processes. This strategic investment aims to streamline manufacturing operations, improve product quality, and increase production output, thereby enhancing the organization's competitiveness within the industry. Similarly, the Implementation of Control Systems sub-theme highlights the defence PSU's incorporation of advanced control technologies such as control algorithms, machine learning, and predictive analytics. Through the implementation of sophisticated control systems, the defence PSU can automate complex processes, optimize resource allocation, and enhance operational performance, positioning the organization at the forefront of industry best practices and innovation. The Integration of Instrumentation Systems sub-theme underscores defence PSU's utilization of advanced instrumentation technologies like smart sensors and remote monitoring solutions to enhance monitoring, data collection, and communication within its operations. This strategic integration of instrumentation systems enhances operational visibility, coordination, and decision-making, contributing to overall efficiency and effectiveness. The various sub-themes within the theme of Technology Integration collectively emphasize the defence PSU's dedication to leveraging advanced technologies to drive transformative changes in its operations.

4.2. Challenges Faced by Employees

The theme of Challenges Faced by Employees at the defence PSU sheds light on the multifaceted obstacles encountered by workers as they navigate the integration of technology into their daily tasks. Employees express concerns ranging from the complexity of machinery and equipment to safety issues, increased pressure to meet deadlines and communication barriers. Addressing these challenges requires a comprehensive approach aimed at providing adequate training, fostering a culture of safety, managing workload effectively, and improving communication processes. Firstly, Skill Gaps in Troubleshooting Complex Systems pose a significant challenge for employees tasked with maintaining sophisticated equipment. Organizations must prioritize initiatives aimed at addressing these skill gaps through targeted training programs and mentorship opportunities to ensure the reliable functioning of machinery and systems. Resistance to Change is another obstacle faced by employees as they adapt to technological advancements within their roles. Organizations must create a supportive environment that acknowledges employees' concerns and empowers them to embrace change positively through effective communication and change management strategies. Learning to Operate Machinery and Equipment poses challenges for employees as they familiarize themselves with new tools and processes. Comprehensive training and support are essential to ensure proficiency in operating modern machinery and equipment, thereby enhancing safety and operational effectiveness. Lastly, Adapting to Changes is crucial as employees transition to new technologies or processes. Change management strategies should focus on providing adequate training, support, and resources to help employees adapt positively to technological advancements. By prioritizing these areas, organizations can create a supportive and conducive work environment that enables employees to thrive amidst technological change.

4.3. Workforce Adaptation Strategies

The theme of Workforce Adaptation Strategies at the defence PSU underscores the importance of various approaches employed by employees to thrive amidst significant technological shifts in their roles. Employees emphasize the creation of an encouraging work environment, skill diversification, and the recognition of employee efforts and achievements as crucial elements in facilitating adaptation to new technologies. One key strategy highlighted by employees is the establishment of a collaborative work culture, where workers feel welcome to ask questions, seek guidance, and collaborate with their peers. This collaborative environment fosters knowledge sharing and mutual support, enabling employees to collectively adjust to new technologies. Research has shown that such collaborative practices improve organizational agility, allowing employees to respond quickly to technological changes. Additionally, rotating tasks and implementing cross-training initiatives are effective adaptation strategies mentioned by employees. By exposing employees to different aspects of their jobs and widening their skill sets, organizations can enhance workforce flexibility and resilience in the face of technological change. Hands-on Training and Practical Experience underscore the importance of providing employees with direct interaction with new technologies in real-world settings. Phased Approach to Change Management advocates for the systematic implementation of technological changes to mitigate risks and promote smoother transitions.

Supportive Environment highlights the importance of creating a workplace culture that encourages experimentation, learning, and collaboration. Diversified Skill Development and Versatile Workforce underscore the importance of exposing employees to diverse tasks and providing them with opportunities to acquire versatile skills. By incorporating

these adaptation strategies into organizational practices, companies can empower their workforce to effectively navigate technological changes and drive continued success in a rapidly evolving landscape.

4.4. Recommendations for HR Professionals and Organizations

The theme of Recommendations for HR Professionals and Organizations underscores the critical role of HR professionals in supporting employees through the challenges and opportunities brought about by technology integration. Employees at the defence PSU highlight various strategies and initiatives that HR professionals can implement to alleviate stress, promote skill development, foster a culture of continuous learning, and support change management efforts.

Firstly, Employee Development and Skill Enhancement emphasizes the importance of prioritizing initiatives aimed at developing and enhancing employees' skills. By investing in training and development programs tailored to specific job roles and technological advancements, HR professionals can ensure that employees possess the necessary competencies to adapt to changes effectively and contribute to organizational goals. Moreover, fostering a Culture of Continuous Learning is crucial for organizations to create an environment where learning is encouraged and valued as a continuous process. By offering access to learning resources and promoting knowledge-sharing among employees, HR professionals can empower individuals to stay updated on industry trends and technological advancements, fostering innovation and adaptability within the organization. Tailored Training and Development Programs are essential for addressing the specific needs of employees. HR professionals should collaborate with business leaders and technology experts to identify skills gaps and develop customized training initiatives that equip employees with the skills required to navigate technological changes effectively. Support for Change Management is also crucial in ensuring that employees feel supported and empowered during times of organizational change. HR professionals can facilitate clear communication, offer training and resources, and foster a culture of open dialogue and collaboration to mitigate resistance to change and increase the likelihood of successful implementation of new initiatives. These recommendations underscore the importance of HR in facilitating a smooth transition and optimizing the benefits of technology integration within the organization.

5. Conclusion

In conclusion, this research study presents important information regarding the effect of technological integration on employee experiences at strategic defense PSUs in India. Researchers conclude that technological progress acts as a transformer, leading to the introduction of strategies and objectives of change management as well as guidance by HR to help employees adjust to new circumstances. Developing transparent communication tactics in organizations, recruiting attention towards employees and forming lifelong learning opportunities are action items organizations can engage in to ensure employee welfare and competitiveness by implementing novel technologies.

Implications

This study explores the impact of employees' experiences with technological integration in Indian organizations. It provides valuable data for organizations to optimize technology integration and employee engagement. The findings can guide the creation of training programs, change management programs, and appropriate organizational policies. The study also provides insights into economic aspects of technology adoption, such as labor markets and workforce dynamics. HR strategies, including recruitment, training, and performance management, play a crucial role in achieving organizational objectives. Effective recruitment practices attract talent, training and development initiatives upskill employees, performance management systems align with technology integration demands, and fostering diversity and inclusion promotes innovation. The study contributes to academic knowledge of the influence of technology on organizational behavior.

Future Scope for Study

In planning for the future, further research could be concentrated on specific business sectors or sectors, period tracking and the impact of new technologies on the job stages and the skills requirements. Human-oriented approaches, attention to ethical concerns, policy mechanisms, and intersectional analyses all should be given more focus to comprehend better the multiple and often complex forces that drive technology-inspired job markets. Bridging those gaps will give a great glance into policy participants, industry stakeholders and the research community struggling to see the future and what should be done now.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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