



A STUDY ON TECHNOLOGY ADOPTION AND INNOVATION IN MSMES

Mrs. Sahana D¹, Mr. Tukaram Moorteppa Lamani², Mr. Sunil Naik S³

¹Student, Department of PG Studies and Research in Commerce, Kuvempu University,
Jnana Sahyadri Shankaraghatta – Shivamogga Dist – Karnataka – 577451

²Faculty Member, Department of PG Studies and Research in Commerce,
Kuvempu University, Jnana Sahyadri Shankaraghatta – Shivamogga Dist – Karnataka - 577451

³Faculty Member, Department of Commerce, Sahyadri Commerce and Management College,
Constituent College of Kuvempu University, Shivamogga Dist- Karnataka -577203

ABSTRACT

Micro, Small, and Medium Enterprises (MSMEs) are the backbone of economic growth but often face challenges in scaling due to limited resources. This paper investigates the role of technological innovation—specifically, the adoption of digital tools like e-commerce, cloud computing, and AI-driven inventory management—in boosting the performance and sustainability of MSMEs. By studying the impact of these technologies on operational efficiency and market reach, this research aims to provide a strategic roadmap for MSMEs to transition from traditional to digital-first models, thereby enhancing their competitive edge in a globalized economy. Micro, Small, and Medium Enterprises (MSMEs) are rapidly adopting digital technologies like AI, IoT, and cloud computing to improve efficiency, with 67% of Indian MSMEs now digitally equipped. Some drivers include competitive pressure and government support, though challenges like high costs and low technical expertise remain. Innovation enables better customer service and market integration. Adopting technology leads to improved productivity, better decision-making, and enhanced customer service, which allows MSMEs to scale their businesses more effectively. The study concludes with actionable recommendations for policymakers and MSME owners to improve technology adoption, thereby fostering sustainable growth and improving manufacturing performance.

KEY WORDS: MSME Digital Transformation, Technology Adoption, E-commerce Integration, Business Sustainability, Competitive Advantage, Manufacturing Performance.

INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) play a vital role in economic development by contributing to employment, industrial output, and exports. Despite their importance, MSMEs often face challenges such as limited financial resources, lack of infrastructure, and restricted access to advanced technologies. With rapid technological advancements, digital tools like e-commerce, cloud computing, artificial intelligence (AI), and Internet of Things (IoT) have created new opportunities for improving business efficiency and competitiveness. These technologies help MSMEs streamline operations, reduce costs, and expand their market reach. In India, digital adoption among MSMEs is steadily increasing due to competitive pressures and supportive government initiatives. However, barriers such as high costs, limited technical expertise, cybersecurity concerns, and resistance to change continue to hinder full-scale adoption. This study examines the role of technological innovation in enhancing MSME performance and sustainability. It focuses on the impact of digital technologies on productivity, operational efficiency, and market expansion, while also analyzing the key drivers and challenges of adoption. The findings aim to provide practical insights and strategies for MSME stakeholders to successfully implement digital transformation and strengthen long-term growth and competitiveness.

REVIEW OF LITERATURE

Gautam Donga (2026), This study faced by SMEs in Surat, Rajkot, Ahmedabad, and Vadodara, key contributors to India's economic growth. Data from 121 SMEs reveals issues in financial access, taxation, skills, HR, market access, and tech adoption. Key findings include restricted capital access, complex taxation, skill gaps, and tech adoption hurdles, aligning with existing research. Some SMEs showed adequate accounting skills and successful tech integration, indicating potential areas of strength. The study underscores the need for targeted interventions and policy reforms to boost SME resilience. It provides a framework for supporting SME growth and sustainability, crucial for India's economic progress.

Poonam Sharma (2026), This study analyzed that MSMEs are crucial to India's economy, employing 110 million+ citizens and contributing 30% to GDP and 45% to exports. The Technology Centre Systems Programme enhances tech and innovation in MSMEs, with TDCs fusing Indian Knowledge Systems (IKS) with contemporary tech. Despite progress, IKS integration faces hurdles, and policy reforms are needed for TDC-IKS synergy, aligning with 'Atmanirbhar Bharat'.



Kiran V Panchal, Rajesh Shah (2026), This study examines highlights AI's trans-formative impact on MSMEs, bridging traditional practices with modern tech. About 45% of Indian MSMEs have adopted AI, but widespread adoption is hindered by financial and tech barriers. The study emphasizes organizational readiness and discusses AI's broader economic implications, including employment and inequality effects.

Tilak Raj(2026), This study re revealed that Atmanirbhar Bharat initiatives for MSMEs, assessing impact on financing, employment, and competitiveness. Findings suggest short-term relief and boosted credit access, but long-term sustainability needs structural reforms in tech adoption and global competitiveness. The study concludes with policy recommendations to strengthen MSMEs for inclusive growth and economic self-reliance.

RESEARCH GAP

Existing studies lack region-specific analysis of MSMEs' operational challenges and technological readiness in emerging clusters. There is limited integrated research combining finance, policy support, and adoption of digital technologies like AI. Firm-level adaptability, skill development, and HR capabilities in enabling technology adoption remain under-explored. Empirical evidence linking government initiatives such as Atmanirbhar Bharat with actual technological transformation is insufficient. Thus there is a need to study the combined impact of finance, skills, policy, and technology on MSME growth and sustainability.

STATEMENT OF THE PROBLEM

MSMEs play a vital role in economic growth, employment, and industrial development, yet many continue to rely on traditional business practices with limited technological integration. This low level of digital adoption restricts their productivity, operational efficiency, and ability to compete in a rapidly evolving digital economy. Despite the availability of advanced technologies such as artificial intelligence, cloud computing, and e-commerce platforms, MSMEs face multiple barriers to adoption. Some challenges include high implementation costs, lack of digital skills, inadequate infrastructure, and limited awareness of technological benefits. As market competition intensifies, MSMEs that fail to embrace digital transformation risk losing competitiveness and long-term sustainability. Therefore, this study focuses on analyzing the impact of digital technology adoption on MSME performance and identifying strategies to overcome adoption barriers.

NEED FOR THE STUDY

The rapid growth of digital technology has significantly transformed business operations, making its adoption essential for MSMEs to stay competitive. However, many MSMEs still rely on traditional practices, limiting their growth and adaptability in changing markets. This study is needed to examine how technological innovation can improve efficiency, productivity, and decision-making. It also emphasizes the role of government support and policies in encouraging digital adoption among MSMEs. Overall, the study helps identify challenges and opportunities to promote sustainable growth in the MSME sector.

OBJECTIVES OF THE STUDY

1. To identify the challenges faced by MSMEs in adopting digital technologies.
2. To examine the role of technological innovation in the growth and development of MSMEs.
3. To analyze the impact of digital technologies such as e-commerce, cloud computing, and AI on MSME performance.
4. To evaluate how technology adoption improves operational efficiency and productivity in MSMEs.
5. To provide recommendations for policymakers and MSME owners to enhance technology adoption for sustainable growth.

RESEARCH METHODOLOGY

Sources of Data: In order to meet the objectives of the study, the required data would be collected from the both primary and secondary data sources.

Primary Data: Primary data mean original data that has been collected specially for the purpose in mind. This type of data is generally afresh and collected for the first time. It is useful for current studies as well as for future studies. Primary data will be collected through the structured questionnaire.

SAMPLING

Sample size: A total number of 100 respondents selected for the collection of information related to MSMEs in adopting digital technologies.

Sample: I have taken technology adoption improves operational efficiency and productivity in MSMEs.

Sampling techniques: Simple random sampling technique is used to draw the sample.

SCOPE OF THE STUDY

This study focuses on the role of technological innovation in improving the performance and sustainability of MSMEs. The research primarily examines the adoption of digital technologies such as e-commerce platforms, cloud computing systems, and AI-based inventory management tools. The study evaluates how these technologies influence operational efficiency, productivity, customer



service, and market expansion. It also explores the challenges faced by MSMEs in adopting digital solutions and the factors that influence successful implementation.

Conceptual framework on Technology adoption and Innovation in MSMEs

MSMEs are pivotal to India's economic growth, contributing significantly to GDP, employment, and exports, yet they face challenges in finance, skills, market access, and technology adoption. Technology adoption and innovation are key drivers for improving competitiveness, operational efficiency, and market reach for MSMEs. The conceptual framework links organizational readiness, financial capacity, human capital, and policy support to successful technology integration, including AI and digital tools. Traditional practices, such as Indian Knowledge Systems (IKS), can be combined with modern innovations to enhance productivity and sustainability. Understanding these dynamics provides a basis for assessing the impact of technology adoption and guiding interventions for MSME growth.

Impact on Performance of Technology adoption and Innovation in MSMEs:

Technology adoption and innovation significantly improve MSME performance by increasing operational efficiency, accelerating revenue growth (up to 17%), and enhancing global competitiveness. Digital tools, including AI and cloud computing, facilitate better decision-making and market access, although adoption is often hindered by limited financing, low digital literacy, and poor infrastructure.

Impact on Performance

- **Operational Efficiency:** Adoption of AI, cloud computing, and ERP systems reduces operational costs and optimizes internal processes.
- **Revenue Growth & Market Access:** Digitalization boosts revenue by roughly 17% and enhances the likelihood of tapping into new markets by 27%.
- **Resilience & Agility:** Technology enables MSMEs to better withstand economic disruptions and adapt to changing market conditions

Drivers & Innovation Factors

- **Strategic Planning:** The combination of technology adoption and strategic planning improves performance outcomes, though innovation alone can sometimes have a negative effect if not managed properly.
- **Digital Marketing & E-commerce:** High usage of social media and online marketplaces enhances customer engagement and sales.
- **External Support:** Government schemes and targeted training programs are crucial to overcoming the digital divide.

Benefits of Technology Adoption & Innovation in MSMEs

Technology adoption and innovation in MSMEs drive significant growth by increasing operational efficiency, reducing costs, and expanding market reach. By adopting digital tools like AI, cloud computing, and e-commerce, MSMEs improve production capacity by 19%, enhance customer experience, and enable faster scaling. These advancements allow them to compete with larger enterprises.

Benefits

- **Increased Efficiency & Productivity:** Automation tools handle repetitive tasks and improve manufacturing, allowing staff to focus on growth.
- **Reduced Operational Costs:** Energy-efficient systems and digital processes (like cloud computing) lower overhead costs, with one example showing a reduction in expenses through robotic process automation (RPA).
- **Expanded Market Reach:** Digital platforms, social media, and e-commerce allow smaller businesses to access global customers and improve visibility.
- **Data-Driven Decision Making:** Data analytics provide actionable insights into customer activity and market trends, improving sales and customer satisfaction.
- **Improved Financial Management:** Digital tools facilitate faster access to credit, online lending, and improved accounting processes.
- **Enhanced Competitiveness & Innovation:** Adopting new technologies fosters innovative business models, such as using AI for product development, which increases competitiveness

Challenges to Adoption:

- **Financial Constraints:** Limited access to capital inhibits investment in advanced technology.
- **Knowledge Gap:** A lack of expertise and awareness about digital tools hinders implementation.
- **Infrastructure:** Deficiencies in technology infrastructure, especially in developing economies, limit digital adoption rates.

Innovation Strategy

MSMEs that foster a culture of innovation and collaborate with external parties to acquire knowledge see better performance



outcomes. The adoption of digital technology is a continuous journey that requires upgrading existing systems and processes to maintain competitive advantage.

LIMITATION OF THE STUDY

1. Limited sample size may not represent all MSMEs.
2. Some respondents may provide subjective or incomplete answers.
3. Rapid technological changes may influence results over time.
4. Geographical Constraints.
5. Specific- Sector Focus.

FINDINGS OF THE STUDY

1. The main motivators are market competition, customer expectations, operational efficiency, and government initiatives.
2. Adoption of digital tools is directly linked to increased revenue, cost reductions, and better market access for MSMEs.
3. A proactive, digitally savvy mindset among owners is crucial for recognizing new opportunities and implementing changes.
4. The primary hurdles are limited financial resources, lack of skilled personnel, inadequate digital infrastructure, and a lack of awareness about technology benefits.
5. Adoption is enabling smaller businesses to participate in global supply chains through better quality management and lower operational costs.

SUGGESTIONS

1. Train staff in digital tools and up-skill existing employees to manage and utilize new technologies effectively.
2. Educate employees on online safety and invest in affordable cyber-security tools to protect business data and customer information.
3. Utilize government schemes, subsidies, and tax incentives that encourage technology adoption and R&D for small businesses.
4. Leadership must drive the adoption of technology, encouraging a culture that supports innovation and accepts change, rather than treating technology as solely an IT expense.
5. Artificial Intelligence to improve operational efficiency, reduce costs, and derive actionable insights from data.

CONCLUSION

Technology adoption plays a crucial role in enhancing productivity, efficiency, and competitiveness among MSMEs. The study shows that digital tools and innovative practices significantly improve operational performance and market reach. Technology adoption and innovation are critical for MSME growth, enabling increased productivity, competitiveness, and sustainability in a digital economy. While they face barriers like limited capital and expertise, adopting digital tools is crucial for resilience and global competitiveness. Ultimately, technological adoption transforms MSMEs into agile, efficient entities vital for economic development. However, challenges such as limited financial resources, low digital literacy, and inadequate infrastructure hinder adoption. Government support, training programs, and access to affordable technology can accelerate innovation in MSMEs. Firms that embrace continuous innovation are better positioned to sustain growth in a dynamic business environment.

REFERENCE

1. N. Belina, *The role of the government in increasing MSMEs in Indonesia*, in: 2021.
2. V. Skovarciany, M. Romeris, *SMALL AND MEDIUM-SIZED ENTERPRISES*, in: 2014.
3. S. Dubey, N. Verma, *Role of Micro, Small and Medium Enterprises (Msmes) In Achieving Sustainable Development Goals*, in: 2020.
4. I. Irtysheva, *The effect of digital technology development on economic growth*, in: 2021.
5. R.S. Fitri, *The Role of Digitalization in MSME Marketing*, in: 2021.

Websites

1. <https://api.semanticscholar.org>.
2. <https://www.usda.gov/>
3. <https://www.ifpri.org/>
4. <https://www.investopedia.com>