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AI For MSMEs: Bridging the Gap between Technology and Business Goals

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Abstract
This paper explores the transformative effect of Artificial Intelligence on Micro, Small, and Medium Enterprises (MSMEs), emphasizing how AI and related technologies are bridging the gap among conventional business practices and modern technological advancements. With increasing competitive pressures and operational challenges, MSMEs are adopting AI to automate routine tasks, enhance decision-making, and optimize business processes. Approximately 45% of Indian MSMEs have integrated some form of AI, reflecting a growing awareness of its strategic value. Despite this, widespread adoption remains limited due to financial constraints, technological complexity, and a reliance on outdated systems. The paper finds the need for organizational, technological, and environmental readiness to facilitate AI implementation. Additionally, it discusses the broader economic implications of AI, including its effects on employment, inequality, and market dynamics, as well as the role of dictatorial frameworks in guiding its adoption.

Keywords: Artificial Intelligence, MSME Sector

Introduction

The emerging technology which is known as artificial intelligence (AI), It has the capacity to completely change our lifestyle, including communication, healthcare, business, and transportation. Artificial intelligence (AI) is the creation of intelligent computers that can mimic human intellect and carry out activities like voice recognition, visual perception, decision-making, and problem-solving that normally call for human cognition. AI is now become so much advanced technology due to the quick increases in processing power, the availability of massive data, and algorithmic improvements.

To optimize and improve any manufacturing firms, continuous improvements are necessary in order to remain competitive. A lot of data is accessible and has to be preserved processed, and evaluated as an outcome of growing digitalization and the integrating of smart devices and technology into production processes.

The implementation of AI and ML in analytics solutions for manufacturing Micro, Small, and Medium Enterprises (MSMEs) has not yet been fully investigated, despite the fact that these technologies are becoming more and more well-liked as ways to satisfy the demands of dynamic, quickly changing manufacturing settings. These businesses are finding it difficult to understand how this new technology is going to impact their management of the company. Businesses must make technological and innovative investments if they want to stay up with

this development and benefit from the competitive advantages that it may provide. According to the European Union (EU), MSMEs are the backbone of the European economy, hence this poses a special challenge for them. About 99 percent of EU manufacturing businesses were small or medium-sized in 2019.

Micro, Small and Medium Enterprises Classification 2020

Size of the Enterprise	Investment and Annual Turnover
Micro	Investment less than Rs. 1 crore Turnover less than Rs. 5 crore
Small	Investment less than Rs. 10 crore Turnover up to Rs. 50 crore
Medium	Investment less than Rs. 20 crore Turnover up to Rs. 100 crore

The purpose of this study paper is to investigate the use of AI in MSMEs, looking at its possible advantages, difficulties, and success factors. This article aims to offer useful insights for MSMEs thinking about implementing AI technology through studying the familiarity with AI in MSMEs, the link between external variables and AI adoption, and the influence on work culture.

AI is currently being used in a wide range of applications, from fraud detection and recommendation systems to virtual assistants and driverless cars. AI has enormous potential for businesses of all kinds, including micro, small, and medium-sized businesses (MSMEs). AI enables companies to streamline operations, enhance decision-making, and provide consumers with individualized experiences by analyzing enormous volumes of data, deriving insightful conclusions, and making decisions on its own.

AI provides MSMEs with a number of significant benefits. First of all, by automating routine and repetitive processes, it can improve operational efficiency and free up staff members to concentrate on more strategic and innovative work. This results in improved performance overall, cost savings, and increased productivity. Second, by examining their wants, interests, and behaviors, AI helps companies to better understand their clients. In the end, this increases customer pleasure and loyalty by enabling targeted marketing efforts, customized customer experiences, and personalized suggestions.

Additionally, MSMEs can estimate demand, recognize trends, make data-driven decisions, and allocate resources as efficiently as possible thanks to AI-powered analytics and predictive modeling. This gives you a competitive advantage in marketplaces that are dynamic and changing quickly. AI also improves the speed and precision of problem-solving, allowing companies to respond to obstacles instantly and make quick changes to their plans.

Even if AI has a lot of potential advantages, there are still obstacles in the way of its widespread implementation. MSMEs may encounter limitations like scarce financial resources, a lack of qualified AI specialists, and ethical and data protection issues.

MSMEs may, however, overcome these obstacles and use AI to promote innovation, growth, and sustainability with the right preparation, funding, and strategic application.

Theoretical contribution: There are several, theoretical implications while adopting AI by MSMEs. First it is important to create a favorable environment within the organization for AI adoption. Organizational, technological, and environmental readiness is important for successful AI implementation. TOE framework helps in evaluating this readiness among MSMEs. Secondly, the paper discusses at length the factors impacting AI readiness from a TOE framework. This study added a new dimension to the TOE (Technological, organizational, and environmental framework). That is the role of ethical consideration. We found that ethical considerations partially mediate an organization's AI readiness. Hence, the third point is the need for organizations to develop ethical guidelines and frameworks before adopting AI in their business. MSMEs therefore need to focus on ethical considerations such as accountability, transparency, and justice. Since they often account up a significant proportion of enterprises and employment possibilities, MSMEs are essential to the global economy.

Literature review

Research by Wang (2022) examines the impact of financial technology on the financing of small and micro enterprises (SMEs), which are crucial to China's market economy.AI in a very short period has become a pervasive technology encompassing all aspects of industrial activities. AI however is regarded as having high cost and heavily technology driven. MSMEs are often cash-strapped and thrive on legacy technologies. The high cost of AI could become a deterrent for MSMEs to adopt AI in a major way in India (Chatterjee, 2020). MSMEs are also more likely to be victims than beneficiaries since they cannot meet the financial, technological, and human resource requirements (Jha et al., 2022). Adopting and implementing disruptive technologies is challenging due to various barriers (Sharma et al., 2022). To counterbalance these negative consequences of AI deployment, the public and private sectors work alongside with the government and academia to provide the appropriate skill sets required for the MSMEs. With the introduction of Industry 4.0 (I4.0) standards, AI began to play a more significant role in its adoption across several industries (Tzafestas, 2018).

We also found that research talks about technology adoption positively influencing the online social media presence of MSMEs. Research studies show that integrating AI algorithms and social networks has positively impacted MSME performance (Herzallah et al., 2021). However, MSMEs confront various issues, including technical obsolescence, supply chain inefficiencies, and increased global competitiveness, and digital transformation could help them overcome these obstacles (Katyal & Xaviour, 2015).

Technological, organizational, and environmental (TOE) factors prompt MSME companies to adopt newer technologies (Stenberg & Nilsson, 2020). Customers, partners, and competitors may put pressure on a company to adopt modern technologies sooner to manage processes more efficiently (Alora & Barua, 2019). As most European and American companies are relocating to developing nations, there are many opportunities for the local MSMEs to partner with these MNCs. This enables technological transfer thereby improving the technology adoption and innovation in the local industry (Jiang et al., 2018).

Artificial Intelligence Readiness: Researchers have identified three significant factors for AI readiness by companies: technological readiness, organizational readiness, and environmental readiness (Narwane et al., 2019). A company's ability to absorb new technology is called technological readiness. Dwivedi (Dwivedi et al., 2023) discussed Organizational readiness, which looks at business size, top management, and factors that influence the adoption of innovations (Wade & Hulland, 2004). A better fit/compatibility between the adoption process and the diffusion of technological innovation makes adoption easier (Ifinedo, 2005). Another factor that prompts MSMEs to adopt AI technology is the perceived benefits of implementing AI (Votto et al., 2021). In a research paper on AI and disruptive technologies, the study shows how AI is better than its competing technologies (Suha & Sanam, 2023). The writers contribute to a comprehensive grasp of the emerging landscape of AI, concentrating on its generative powers and their application in actual industrial contexts (Kar et al., 2023). Study focus into several ways to address biases in AI, contributing to a more nuanced understanding of the complicated issues of bias management in AI systems and laying the groundwork for future advancements in this vital field (Varsha, 2023). In the same vein, Kar et al. provide a better understanding of the complex terrain of AI readiness in business by providing insights into the fundamental factors and barriers that influence organizational decisions (Kar & Kushwaha, 2021; Kar et al., 2021)

Objectives of the Study

- To identify key benefits and challenges of using AI in MSME sector.
- To explore how AI improves efficiency in MSME sector
- To explore the function of AI in micro, small, and medium enterprises (MSMEs).

Methodology

This study adopts a qualitative review approach, analyzing peer-reviewed articles, case studies, and institutional reports published. Databases including Science Direct, Google Scholar, and Scopus were used to source literature from various disciplines published literature, industry case studies, academic journals, corporate sustainability reports, and reliable databases.

Why Should MSMEs Consider AI Adoption?

AI has evolved from a far-off futuristic technology to a strategic growth partner that provides Indian MSMEs with:

- Enhanced productivity and operational efficiency
- An informed judgment based on data-producing
- A decrease in total business expenses
- Improved relationships and satisfaction with customers

Advantages of AI IN MSME Sector: According to research, machine learning and artificial intelligence (AI) may play a key role in achieving the SDGs. About 40% of all industrial production in a developing country like India comes from micro, small, and medium-sized businesses (MSMEs), which make up 96% of all industrial units .MSMEs are among the largest employers in the area, providing jobs to the many urban poor MSMEs' top issue is how technology preparedness may benefit businesses, particularly in terms of employee empowerment. MSMEs have the power to improve social cohesion in local communities,

increase living standards, and grant equitable access to resources. MSMEs can support economic growth that is more inclusive. Encouraging stronger social bonds, ethical conduct, and fair employment creates more stable ecosystems that are less susceptible to societal instability or economic shocks. By maintaining moral principles and enhancing their reputation, MSMEs can more easily enter global markets.

MSMEs' Current Challenges in AI Adoption:

Financial limitations, such as the high cost of infrastructure, tools, and training, make it difficult for micro, small, and medium-sized enterprises (MSMEs) in the nation to implement artificial intelligence (AI) solutions, despite the fact that more and more firms are embracing AI. Budgetary constraints also add to the impression that AI investments are costly and high-risk. According to data released by the Bangalore Chamber of Industry and Commerce (BCIC) at a summit in April of this year, India's manufacturing adoption rates of AI are very low—less than 25% in organized manufacturing and about 15% in the case of MSMEs. However, AI adoption rates in manufacturing are 35–40% in countries like the US, China, and Germany. Pricing, according to experts, is a major factor limiting adoption in India.

59% of India's MSMEs find it difficult to engage in AI because of the high costs of tools, equipment, and training, according to a survey conducted by the Institute for Competitiveness for NITI Aayog. Additionally, according to 91% of MSMEs, AI needs to be accessible and reasonably priced for all. Financial assistance in the form of grants, subsidies, and low-interest loans was suggested by the study. The report, however, was vague about the interest rate, qualifying requirements (whether they applied to all MSMEs or just a few), and the scope of support.

According to the Union Budget 2025, corporations with investments up to Rs 25 crore will now be referred to as small enterprises, up from Rs 10 crore; MSMEs with investments up to Rs 125 crore will now be recognized as medium enterprises, up from the previous limit of Rs 50 crore; and MSMEs with investments up to Rs 2.5 crore will now be classified as microenterprises, up from the previous threshold of Rs 1 crore.

Role of AI on the growth of MSMEs:

There are many facets to how AI is affecting the workforce in SMEs. Automation has made mundane activities more efficient, but in order to fully utilize AI, workers must also be up skilled. In order to meet the changing needs of AI integration, the study highlights the significance of a strategic approach to talent development. Artificial Intelligence Assists Small and Medium-sized Enterprises in Enhancing Decision-making. AI is crucial in substantially lowering prediction expenses, thus facilitating the decision-making processes for SMEs. This transformative technology enables predictive analytics, risk reduction, real-time business forecasting, and efficient asset management. AI enables automation of repetitive and mundane tasks, reducing human effort and increasing operational efficiency in MSME sector. This leads to cost savings, improved productivity, and faster processing times AI systems can analyze vast amounts of data, identify patterns, and make data-driven decisions with speed and accuracy it increases the profit in MSME unit.

Findings and Discussion

By making it simple to track options and activities, artificial intelligence (AI) technologies can increase corporate transparency. This could promote a culture of accountability and ethics in the workplace. AI in business processes has been shown to promote innovation and ensure responsible decision-making based on responsibility, transparency, and fairness. By ensuring consistency with human values, promoting accountability and transparency, and prohibiting discrimination, the use of AI can promote innovation, expansion, and overall success (Chatterjee et al., 2023). MSMEs may gain a competitive edge, insure long-term survival, and become more competitive in the market using the upcoming trends and innovations of the AI. Adopting AI in MSMEs may foster creativity, increase operational effectiveness, and improve the quality of products and services. MSMEs can secure long-term survival, and have a competitive advantage by the implementation of AI. In MSMEs, AI can help to reduce risks and promotes social justice by fostering social diversity, equality and inclusion. Partnerships and collaborations are essential to achieve fairness and inclusion in the complicated field of sustainability in conjunction with artificial intelligence.

Conclusion

The era of AI transformation is NOW. By embracing well-structured AI strategies and solutions, India's MSMEs can sustainably modernize their operations, boost profitability, and stay competitive globally. Take the first step towards your AI modernization journey today and achieve unmatched business growth and success. Micro, small, and medium enterprises (MSMEs) can learn from artificial intelligence (AI) for better decision-making, operational optimization, increased employability, and employee empowerment. In conclusion, AI represents a paradigm shift in how businesses operate and make decisions. Its potential to enhance efficiency, improve customer experiences, and enable data-driven decision-making makes it a powerful tool for MSMEs seeking to stay competitive in today's digital age. By embracing AI and addressing the challenges, MSMEs can unlock new opportunities and navigate the evolving business landscape with confidence. Overall, AI is not only a tool for efficiency but also a driver of innovation and growth for MSMEs seeking to thrive in a digital economy. AI systems can inadvertently perpetuate existing biases present in historical data, potentially leading to discriminatory practices in hiring and performance assessments.

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