A Study on the Impact of AI on Indian MSMEs

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The MSMEs are considered Engine of Growth due to the ability of the sector to generate employment, optimum utilization of locally available resources and production of a variety of products. Introduction of AI has ensured cost reduction, increased operational efficiency and better decision-making. This paper is an attempt to analyze the advantages and challenges AI is likely to pose on Indian MSMEs and the degree of preparedness of the sector to successfully implement AI. The MSMEs especially Micro firms need more awareness and expertise regarding data privacy and choosing appropriate AI model to satisfy their business needs.

Keywords: MSME (Micro, Small and Medium Enterprises), AI (Artificial Intelligence), Automation, Optimization, Operational Efficiency

1. Introduction

Micro, Small and Medium Enterprises (MSMEs) are the growth engine of Indian economy as the sector contributes about 30 percent of Indian GDP, employs more than 110 million people (approximately 23 percent of total workforce in India), produces more than 6000 varieties of products, ensures proper utilization of resources and balanced economic growth by removing regional disparity **(Annual Report of MSMEs, 2023-2024)**.

Table 1

Year	Share of MSME GVA in All India GDP (in %)
2014-15	29.34
2015-16	29.48
2016-17	29.25
2017-18	29.75
2018-19	30.27
2019-20	30.5
2020-21	27.3
2021-22	29.6
2022-23	30.1

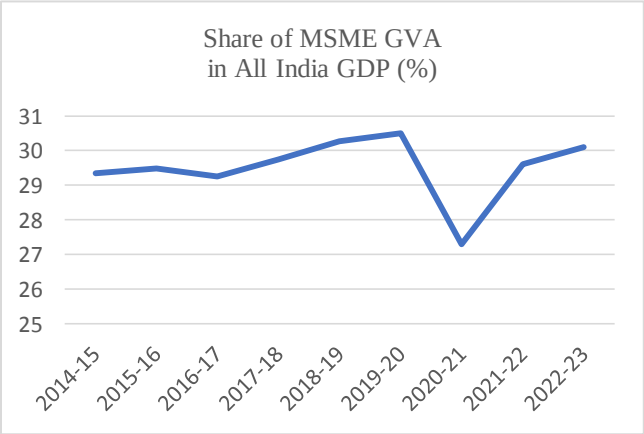

Figure 1 *Share of Gross Value Added (GVA) of MSME in all India GDP*
Source: *Ministry of Micro, Small and Medium Enterprises Press Release on 22.07.2024 available at pib.gov.in*

With a significant advancement in technology, artificial Intelligence (AI) has started playing a major role in operation of MSMEs in terms of quick decision-making, processing of huge volume of data in split seconds, helping the MSMEs in innovation, increasing productivity and minimizing operational costs.

As per the study conducted by **NASSCOM-META (2024)**, 94 percent of technology-driven MSMEs in India are aware of the impact of AI (**NASSCOM-META, 2024; Zoho, 2025**; **Patil and Swaroop, 2025**). AI market in India is experiencing a steady growth as the sector is expected to achieve 40 percent growth in 2025 **(Daga et al, 2025)** and expected to touch 27 billion Dollar by 2027 registering an expected annualized growth rate 25 percent to 35 percent between 2024 and 2027 **(NASSCOM, 2025).** In spite of huge growth potential of AI in MSME sector, application of AI is still limited due to high initial cost, lack of skilled workers, lack of awareness, poor mobilization of resources and infrastructural bottlenecks.

2. Objectives of the Study

The following are the major objectives of the study:

- To discuss the changing pattern of definition of MSMEs to increase the competitiveness of the sector
- To identify the major advantages and challenges of implementation of AI in Indian MSMEs
- To analyze the current scenario of AI adoption in Indian MSMEs

3. Review of Literature

Bhavani, T.A. (2011) argued that though the MSME sector was known to generate large employment, most of such jobs were low-income jobs as the general level of technology employed in Indian MSMEs was poor. Employment generation was high in quantitative term but such jobs offered very low remuneration. The MSMEs were in urgent need of technological upgradation to create quality employment improving remuneration, duration and skill. Due to this structural shift, employment generation might be less in the short run but would ensure high-income employment generation in the long run.

NASSCOM (2024) study observed that 94 percent of MSMEs are aware of AI but 87 percent of such units believe that AI can make meaningful changes in MSME operation. There exists a wide gap between having an idea about AI and actually implementing AI in MSME operations as 65 percent of such units do not have any idea about the right AI tools to be used and 91 percent of the sample MSME units believe that AI may not be widely used in MSMEs due to financial and technological constraints. The study highlighted the importance on conducting workshops, seminars and demonstration sessions to encourage the MSMEs to effectively use AI.

Patil and Swaroop (2025) identified the prospective role of AI in Indian MSMEs enabling the units speeding -up decision-making procedure, processing high volume data, reducing operational costs and encouraging innovation. Though a significant percentage of MSME-owners are aware of the benefits of AI, application scenario is not very encouraging due to lack of technically sound workers, apprehensions to adopt new technology and high initial cost of installation of AI technology.

Dhanalakshmi et al (2025) observed that adoption of AI can significantly contribute in enhancing the performance of Indian MSMEs by increasing productivity, ensuring consumer satisfaction and proper mobilization of resources. The Govt has a vital role to play by offering affordable AI solutions through Public-Private Partnerships, capacity building programmes and suitable policy reforms for easy digital transformation to increase competitiveness of the sector.

4. Database and Methodology

The study is based on secondary data mostly collected from the Annual Reports published by the Ministry of MSMEs (relevant years), reports published by RBI, survey reports published by NASSCOM and research papers published by different independent researchers. Data has been used to study the changes in the definition and concept of MSMEs from 1950 to 2020, to understand the advantages and challenges of adoption of AI and to know the current scenario of AI implementation in Indian MSMEs

5. Results and Discussions

5.1 Changing Pattern of Definition of Micro, Small and Medium Enterprises (MSMEs)

5.1.1 Concept of Small-Scale Industries (SSIs)

Table 2 *Definition of Small-Scale Industries (SSI)*

1950	**Gross Investment in Fixed Assets: not Exceeding Re. 0.5 Million**	**Employment less than 50 Workers Per Day (with the Use of Power) or less than 100 Workers Per Day (Without the Use of power)**
1958	Gross Investment in Fixed Assets: Less than Re. 0.5 Million	Employment less than 50 Workers Per Day (with the Use of Power) or less than 100 Workers Per Day (Without the Use of Power) except that the Criteria based on the employment 'per day' was henceforth replaced by a 'per shift' provision
1959	Gross Investment in Fixed Assets: Value of Machinery (Original)	Employment less than 50 Workers Per Day (with the Use of Power) or less than 100 Workers Per Day (Without the Use of Power) except that the Criteria based on the employment 'per day' was henceforth replaced by a 'per shift' provision
1960	Gross Investment in Fixed Assets: Value up to Re. 0.5 Million	The employment condition was dropped from the definition

1966	Up to Re. 0.75 million	No condition
1975	Up to Re. 1 million	No condition
1977	Up to Re. 1 million	No condition
1980	Up to Rs. 2 million	No condition
1985	Up to 3.5 million	No condition
1991	Up to Rs.6 million	No condition

Source*: Industries (Development and Regulation) Act, 1951 and Reserve Bank of India*

5.1.2 Concept of Micro, Small and Medium Enterprises (MSMEs) as per Micro, Small and Medium Enterprises Development (MSMED) Act, 2006

The Micro, Small and Medium Enterprise Development (MSMED) Act was introduced in 2006 to increase the competitiveness of MSME sector, to ease the legal provisions applicable for the sector and to provide infrastructural, marketing and financial assistance.

Table 3 *Investment Limits in MSMEs as per MSMED Act, 2006 (Valid up to 30.06.2020)*

Manufacturing Sector	
Enterprises	**Investment in Plant & Machinery**
Micro Enterprises	Does not exceed twenty-five lakh rupees
Small Enterprises	More than twenty-five lakh rupees but does not exceed five crore rupees
Medium Enterprises	More than five crore rupees but does not exceed ten crore rupees
Service Sector	
Enterprises	**Investment in Equipment**
Micro Enterprises	Does not exceed ten lakh rupees:
Small Enterprises	More than ten lakh rupees but does not exceed two crore rupees
Medium Enterprises	More than two crore rupees but does not exceed five crore rupees

Source: *Ministry of Micro, Small and Medium Enterprises (MSMEs), Government of India, Annual Report 2018-19*

5.1.3 Concept of Micro, Small and Medium Enterprises (MSMEs) with effect from July 1, 2020

As per the latest development, the definition of MSMEs was again changed by the Govt. with effect from July 1, 2020. As per revised definition, an enterprise shall be classified as a micro, small or medium enterprise on the basis of Table 4:

Table 4 *Revised Definition of MSMEs (Valid from July 1, 2020 onwards)*

Composite Criteria: Investment in Plant & Machinery/equipment and Annual Turnover			
Classification	**Micro**	**Small**	**Medium**
Manufacturing Enterprises and Enterprises rendering Services	Investment in Plant and Machinery or Equipment: Not more than Rs.1 crore and Annual Turnover; not more than Rs. 5 crores	**Investment in Plant and Machinery or Equipment:** Not more than Rs.10 crore and Annual Turnover; not more than Rs. 50 crores	**Investment in Plant and Machinery or Equipment:** Not more than Rs.50 crore and Annual Turnover; not more than Rs. 250 crores

Source: *https://msme.gov.in/know-about-msme*

The new definition of MSMEs has significantly increased the levels of investment in Plant & machinery or Equipment and would encourage the MSMEs to carry out expansion scheme. This will also be helpful in increasing competitiveness, job opportunities and export.

5.2 Advantages of AI in MSME Sector

5.2.1 Better Performance in Time Taking and Repetitive Works

AI can be ideally suited for repetitive and time-consuming activities of MSMEs like quality control, customer feedback, working capital management and inventory management. AI can process huge volume of data, identify data pattern and ensure fewer manual interventions in these activities so as to reduce operational costs and achieve better operational efficiency **(Dhanalakhmi, 2025).**

5.2.2 Improved Customer Services

AI facilitates personalized interaction with the customers and can predict any change in pattern of taste, preference and choice of the customers. It helps the MSMEs to make necessary changes in production process as per customized recommendations,

introduce tailored marketing and create satisfied customers through 24/7 customer care by Chatbot and personalized product recommendations **(Kakkar, 2025)**.

5.2.3 Forecasting Future Trends

AI can forecast future business trends like change in taste and preference of the consumers, sales and profitability of the unit based on authentic data. This facility can be extremely helpful for a sensitive sector like MSMEs to take decisions proactively and increase their competitiveness.

5.2.4 Minimizing Cost

Predictive analysis, automation and planned mobilization of resources carried out by AI can reduce operational cost of the MSMEs. They can reduce about 12 percent of operational cost in supply chain management by implementing AI tools **(Daga, 2025)**.

5.2.5 Better Financial Management

Lack of institutional financing has been a major problem for the MSMEs as the MSMEs are not the coveted field of investment by financial institutions due to information asymmetry, informal business operations, lack of financial planning and higher incidences of Non-performing Assets (NPA).

AI tools can effectively estimate credit potential for MSMEs, identify the sources from which credit can be obtained at a competitive rate and offer best planning for optimum utilization of credit. The entire process increases the credit-worthiness of MSMEs and increases their potential to get loans from the financial institutions.

5.2.6 Increasing Productivity

AI can increase MSME productivity in both quantitative and qualitative term using predictive analysis, reducing idle time, developing proper inventory management system and ensuring quality control.

5.2.7 Increasing Competitiveness of MSMEs

AI algorithms ensure lower production and operational cost, better financial planning and personalized customer support for the MSMEs. MSMEs can compete with the large businesses by focusing more on automation and innovation using AI tools.

5.3 Challenges of AI for the MSMEs

5.3.1 High Initial Cost

Installation of AI tools require high initial investments. Many MSMEs, especially the Micro firms have limited fund allocation for new technology.

5.3.2 Lack of AI Trained Workers

AI being a new field of technology requires highly trained workers capable of implementing and managing AI solutions. Most of the MSMEs do not have highly skilled workers as most of such workers prefer large companies. This skill gap may hinder effective implementation of AI in MSMEs.

5.3.3 Lack of Willingness to Implement AI

As different studies have rightly pointed out, most of the MSMEs are aware about the usefulness of AI but only a small portion of such units are actually willing to implement AI in their units. Most of them are confused about the different AI tools, actual implementation process and requirement of funds. Proper AI training and counselling programmes can be arranged frequently to orient and encourage the MSME units to adopt AI in their operations.

5.3.4 Security Issues

Installation of AI in MSMEs involves processing a large volume of sensitive data. The MSMEs need to set up proper security system to prevent cyber-attacks and unauthorized use of data **(Kakkar, 2025)**.

5.3.5 Possibility of Job Displacement

As AI focus on automation and reduction of human intervention, installation of AI in MSMEs can adversely affect the unskilled workers as repetitive and time-consuming works can be better performed by AI tools.

5.3.6 Lack of Authentic data and Digital Unpreparedness

The pre-requisites of AI tools to work well are the availability of reliable data, proper connectivity and digital workflows. Many Indian MSMEs do not satisfy all these requirements.

5.4 Current Scenario of AI Adoption in Indian MSMEs

5.4.1 AI uses in different MSMEs

AI can be extremely helpful in many MSME sectors like Manufacturing, retail & E-Commerce, IT Services, Agri-processing MSMEs, Textile & Apparel, Pharmaceuticals and Financial Services.

Table 5 *Summary of AI Uses in different MSMEs*

Type of MSMEs	Use of AI
Manufacturing	Predictive maintenance, Quality control
Retail & E-Commerce	Chatbots, Inventory control, Customer personalisation
IT services	AI helpdesk, Cyber security
Agriculture	Yield prediction, Grad logistics
Textile	Design AI, Defect detection
Pharmaceuticals	Drug R & D, Demand forecasting
Hospitality industries	Booking chatbots, Sentiment analysis
Financial services	Credit scoring, Fraud detection
Handicrafts	E-Commerce AI, Design automation

Source: *1. Patil & Swaroop (2025)*

5.4.2 Different Survey Results Vs Current Status of AI Adoption in Indian MSMEs

Different studies have observed that the Indian MSMEs are aware about AI and believe that AI adoption is going to be extremely vital in near future. As per the survey conducted by **Zoho Corporation in retail sector in 2025**, 60 percent of surveyed MSMEs acknowledged the need for adoption of AI. As per the survey of **NASSCOM and Meta Platforms in 2025**, 87 percent of MSMEs believe that AI can improve productivity and customer relations. However, the actual adoption of AI in MSMEs is not satisfactory. According to the study conducted by Bangalore Chamber of Industry and Commerce (BCIC) in 2025, AI adoption in organized manufacturing sector and MSME sector in India is less than 25 percent and 15 percent respectively. Though the current adoption rate of AI in Indian MSMEs is very low, many entrepreneurs are aware of the benefits of AI and AI adoption rate is expected to increase in future.

6. Recommendations

1. To reduce the cost burden, subsidies can be offered to the MSMEs as per different Govt. Schemes. Such support can reduce 20 percent of initial AI establishment cost **(Daga, 2025).**
2. A number of Training Programmes on AI must be organized regularly to familiarize the MSMEs about choosing the right AI solution and operating the tool.
3. More courses of study on AI should be initiated to ensure steady supply of trained workers
4. A proper ecosystem among Govt, Industry, Tech Companies and Training Institutes must be developed to make AI adoption meaningful.

7. Conclusion

Adoption of AI can be a vital step to make Indian MSMEs more competitive by helping the units to take data-based decision making, sound financial planning, 24/7 customer support and minimize operational cost. Different AI tools significantly reduce human intervention and time consumption while increasing accuracy. The Govt. initiatives like Digital India and National AI Strategy should create an ideal condition for AI adoption. However, proper implementation of AI in MSME sector requires high initial cost, digital preparedness and trained work force. Moreover, most of the MSMEs believe that AI would be helpful but do not have a clear idea about choosing right AI solution and its operation procedure. This is the main reason why AI adoption rate is markedly low in spite of the fact that the majority of MSMEs are aware of the impact of AI. Proper arrangement for training on AI tools, successful implementation of Govt. schemes and creating a collaboration among the Govt, industry, financial institutions and training institutions may be helpful in effective adoption of AI in Indian MSMEs.

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