

Available in online @ www.iaraindia.com

RESEARCH EXPLORER-International Journal on Economics and Business Management

ISSN: 2250-1940 (P) 2349-1647 (O)

Impact Factor: 8.276 (I2OR), 3.676 (COSMOS)

Volume XIV, Issue 49

October - December 2025

Formally UGC Approved Journal (63185), © Author

THE IMPACT OF ARTIFICIAL INTELLIGENCE ON THE GROWTH AND PERFORMANCE OF SMALL AND MEDIUM ENTERPRISES (SMES) WITH REFERENCE TO PUMP INDUSTRIES IN COIMBATORE

Dr. D. MOORTHY

Associate Professor and Head

Dept. of Commerce – BPS

Sri Ramakrishna College of Arts and Science (Autonomous)

Coimbatore- 641006.

Dr. J. CHRISTINA JEYADEVI

Assistant Professor

Department of Commerce – CA

PSG College of Arts & Science (Autonomous)

Coimbatore- 641014.

Dr. THIRUMAL RAMAN

Senior Lecturer

School of Accounting and Finance

IBS University, Papua New Guinea.

ABSTRACT

In the changing business world, AI has found a large place in transforming business in innovation, efficiency and effectiveness, consistency, and competitiveness among the other businesses. AI has become inevitable in the growth of any organisation either small or big. In this study, the small and medium enterprises are taken to know how AI influenced in the growth and development of the organisation. For the study, 60 SMEs have been taken and data were collected by structured questionnaire distributed and interviewed in person. The collected data were analysed by using percentage analysis and correlation coefficient. The results showed that there was a huge response for the introduction of AI in SMEs in the growth and development, but with few difficulties in the implementation and adaption of AI in SMEs.

Keywords: Artificial Intelligence, Awareness of AI, Financial performance, Productivity, Adoption of AI.

INTRODUCTION

Artificial Intelligence (AI) has emerged in the world of competitiveness, in understanding the customers, their needs and wants, in driving innovation, increasing efficiency, increasing sales, improved decision making in all fields of businesses and service organisations. The importance of AI has been already implemented and developed in big and large businesses, but it is less in SMEs when compared to large organisations. In today's world, Small and Medium Enterprises (SMEs), which constitute the backbone of most economies, are

increasingly recognizing the potential of AI to enhance their productivity and business performance. As AI brings automating routine processes, improving decision-making through data analytics, and enabling better customer engagement, AI technologies are reshaping the way SMEs operate and compete in both domestic and global markets.

SMEs play a vital role in economic development by contributing to employment generation, industrial output, and export growth. However, many SMEs face challenges such as limited financial resources, inadequate technological infrastructure, and lack of skilled manpower. In this context, the adoption of AI offers an opportunity to overcome these barriers by optimizing operations, reducing costs, and promoting innovation. Through AI-driven tools such as predictive analytics, chatbots, machine learning algorithms, and intelligent automation, SMEs can enhance productivity, improve customer satisfaction, and make informed strategic decisions. The impact of AI on the growth and performance of SMEs is therefore complicated it influences not only operational efficiency but also competitiveness, innovation capability, and long-term sustainability. As governments and industries increasingly promote digital transformation, understanding how AI affects SMEs becomes crucial for shaping supportive policies and strategies. This study tries to explore to what extent of AI adoption in the SME sector, impacts the business performance, and the challenges and opportunities associated with its implementation in their organisation.

REVIEW OF LITERATURE

According to (Wang, 2022; Wang, 2022), research focuses on understanding how financial technology influences the financing of small and micro enterprises (SMEs), which are critical to China's market economy. Small and medium-sized enterprises often struggle to obtain reasonable finance. Fintech, particularly unsecured credit loans, is a possible alternative, with new technologies such as 5G, IoT, and AI poised to improve these services. To fully exploit fintech for SME finance, it is critical to collect extensive data, strengthen the financial environment, and create machine learning models for specific industries. The study's limitation is the lack of empirical data and models, thus future research should fill this gap through data-driven analysis and model construction.

According to Anuj Kumar (2022), the research focuses on the benefits and obstacles that SMEs experience when adopting artificial intelligence. The article emphasizes the importance of upgrading organizations and improving employee abilities to adapt to technological advancements. The article discusses the challenges of using AI in various industries, as well as how customized AI solutions can boost corporate performance.

Sara I. C. Lemos (2022) found that SMEs have major change management issues when adopting AI solutions. Managing the subjective and multifaceted nature of these difficulties is essential for success. This study presents a constructivist multi-criteria analysis system using cognitive mapping and DEMATEL methodologies in a neutrosophic setting. The model categorizes major elements affecting SME adaption to AI as human resources, IT infrastructure, know-how, organizational policies, and leadership. Despite constraints such as a non-generalizable environment and a homogeneous expert panel, the study offers useful insights. Future research should address these limitations and contribute to the expanding field of AI adaption in SMEs.

STATEMENT OF THE PROBLEM

Small and Medium Enterprises (SMEs) are like the eyes of the nation, forming the growth and development of a place, people, employment, income, standard of living, contributing the whole region as well as the nation. Despite these contributions, SMEs are facing numerous challenges in finance, productivity, technology, and competition from large and global players. To eradicate these challenges, the Artificial Intelligence (AI) has come into being as a powerful tool to help SMEs and to improve their overall performance. Since large organizations have already started using AI for the automation of processes, predictive business

analytics, and customer perceptions, the adoption of AI in SMEs remains slow due to certain factors such as inadequate awareness, insufficient technical knowhow, and high-cost implementation. But, since the need of AI in SMEs is unavoidable, there is a need to understand how AI influences the growth and development, and productivity, and competitiveness of SMEs. This study tries to understand the AI implementation would bring the growth and development of SMEs in the digital transformed universe.

THE OBJECTIVES OF THE STUDY

The following are objectives of the study taken by the researchers.

1. To know the level of awareness in adopting AI in Small and Medium Enterprises.
2. To study the impact of adopting AI technologies on the growth and performance of SMEs.
3. To suggest organisation for the effective utilization of AI to improve productivity and competitiveness in SMEs.

SCOPE OF THE STUDY

The study focused on the examining the impact of Artificial Intelligence (AI) on the growth and performance of Small and Medium Enterprises (SMEs) in Coimbatore. The research aims to understand how AI-based technologies are being adopted in business operations such as production, marketing, finance, human resources, and customer services in SME sector. The study also tries to understand the role of AI in operational efficiency, decision-making, technical innovation, and business competitiveness. The study is confined to a specific region, say, Coimbatore, to have an in-depth understanding of local business conditions, policy support, and technology adoption trends and if conducted in other parts of the country would bring the complete economic development of the regions and nation.

SIGNIFICANCE OF THE STUDY

The present study on “The Impact of Artificial Intelligence on the Growth and Performance of Small and Medium Enterprises (SMEs) with reference to Pump Industries in Coimbatore)” in the current digital era, and the role of AI technology in vital role in the success of the business. SMEs form the backbone of the regional and nation’s economy, contributing to employment, innovation, and industrial production. To cope-up with the competition in a rapidly changing business environment, SMEs must adopt advanced technologies like Artificial Intelligence (AI) for the growth and development of the organisation and for the owners of SMEs for taking decision-making. By adopting AI technologies, organisations and other bodies associated with the organisation in designing support mechanisms, training programs, and financial incentives to promote AI adoption among SMEs.

SAMPLING DESIGN

The study conducted in Coimbatore, Coimbatore is big and fast developing city next to Chennai in Tamil Nadu. There are many manufacturing industries functioning in Coimbatore, supplying over 40-50 % of India’s motor/pump production and other products. The AI technology influencing these sectors more effective, while comparing other parts of India. There are more than 600 pump industries are in Coimbatore, the researcher conducted this present study in Coimbatore by using convenient sampling method by selecting 60 SMEs, distributing, and collecting data by the structured questionnaire prepared for data collection.

ANALYSIS AND INTERPRETATION

The researcher used percentage analysis to shows the output of impact of AI on the growth of SMEs and Impact of AI on the Performance of SMEs.

Correlation coefficient used to find the relationship between the variables which taken under the impact of growth of SMEs and Impact of AI on the performance of SMEs.

Level of awareness in adopting AI in SMEs

The entire world speaks about AI implementation and impact event invariable age groups. The SMEs also implementing AI in their work place to reduce errors and to get good

output from the available resources. The researcher finds the level of awareness of AI adopting in SMEs.

Table No. 1
Level of awareness of AI in SME

Sl. No.	Level of awareness	Number of sample employers	Percentage
1	Less	9	15.00
2	Moderate	18	30.00
3	High	33	55.00
	Total	60	100

Source: Computed data

The above table shows the level of awareness of AI in SMEs, out of sixty sample employers, nine (15.00%) sample respondents are felt less level of awareness of AI. Eighteen (30.00%) respondents felt moderate level of AI and remaining thirty three (55.00%) sample employers felt high level of awareness of AI. Majority (55.00%) of the sample employers felt high level awareness of AI.

Impact of AI on the Growth of SMEs

The researcher has taken five variables under the impact of AI on the growth of SMEs.

1. Enhanced Decision-Making
2. Improved Operational Efficiency
3. Market Expansion and Innovation
4. Scalability and Flexibility
5. Competitive Advantage

Table No. 2
Level of Impact of growth of SMEs.

Sl. No.	Variables	Less Impact	Normal Impact	High Impact	Total
1	Enhanced Decision-Making	12 (20.00%)	29 (48.33%)	19 (31.67%)	60
2	Improved Operational Efficiency	7 (11.67%)	32 (53.33%)	21 (35.00%)	60
3	Market Expansion and Innovation	15 (25.00%)	34 (56.67%)	11 (18.33%)	60
4	Scalability and Flexibility	10 (16.67%)	35 (58.33%)	15 (25.00%)	60
5	Competitive Advantage	8 (13.33%)	19 (31.67%)	33 (55.00%)	60

The researcher has taken 60 SME for this study, the impact of AI on the growth of the SME were taken, the above table shows the level of growth because of AI in SMEs.

Enhanced decision – making

Out of 60 samples, twelve (20.00%) employers felt less impact. Twenty nine (48.33%) employers felt normal impact and remaining nineteen (31.67%) sample employers felt high impact. Majority (48.33%) of the sample respondents felt **normal impact** of AI in enhanced decision making.

Improved Operational Efficiency

Out of 60 samples, seven (11.67%) sample employers felt less impact. Thirty two (53.33%) employers felt normal impact and remaining twenty one (35.00%) sample employers

felt high impact. Majority (53.33%) of the sample respondents felt **normal impact** of AI in improved operational efficiency.

Market expansion and Innovation

Out of 60 samples, fifteen (25.00%) sample employers felt less impact. Thirty four (56.67%) employers felt normal impact and remaining eleven (18.33%) sample employers felt high impact. Majority (56.67%) of the sample respondents felt **normal impact** of AI in enhanced market expansion an innovation.

Scalability and Flexibility

Out of 60 samples, ten (16.67%) sample employers felt less impact. Thirty five (58.33%) employers felt normal impact and remaining fifteen (25.00%) sample employers felt high impact. Majority (58.33%) of the sample respondents felt **normal impact** of AI in scalability and flexibility.

Competitive Advantage

Out of 60 samples, eight (13.33%) sample employers felt less impact. Nineteen (31.67%) employers felt normal impact and remaining thirty three (55.00%) sample employers felt high impact. Majority (58.33%) of the sample respondents felt **high impact** of AI in scalability and flexibility.

Table No. 3

Correlation : Relationship between : Enhanced Decision-Making, Improved Operational Efficiency, Market Expansion and Innovation, Scalability and Flexibility and Competitive Advantage

		Enhanced Decision-Making	Improved Operational Efficiency	Market Expansion and Innovation	Scalability and Flexibility	Competitive Advantage
Enhanced Decision-Making	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	60				
Improved Operational Efficiency	Pearson Correlation	.930**	1			
	Sig. (2-tailed)	.001				
	N	60	60			
Market Expansion and Innovation	Pearson Correlation	.841**	.788*	1		
	Sig. (2-tailed)	.001	.001			
	N	60	60	60		
Scalability and Flexibility	Pearson Correlation	.755**	.316	.827*	1	
	Sig. (2-tailed)	.001	.279	.001		
	N	60	60	60	60	
Competitive Advantage	Pearson Correlation	.803**	.883*	.993**	.263	1
	Sig. (2-tailed)	.001	.001	.60	.60	
	N	60	60	60	60	60

*. Correlation is significant at the 0.05 level (2-tailed).

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

Improved operational efficiency (0.930), market expansion and innovation (0.841), scalability and flexibility (0.755) and competitive advantage (0.803) has positive and significant relationship with enhanced decision making at 1% significant level.

Market expansion and innovation (0.788) has positive and significant relationship with improved operational efficiency at 1% significant level.

Competitive advantage (0.883) has positive and significant relationship with improved operational efficiency at 5% significant level.

Scalability and flexibility (0.827) has positive and significant relationship with Market Expansion and Innovation at 5% significant level.

Competitive advantages (0.993) has positive and significant relationship with Market Expansion and Innovation at 1% significant level.

It concluded that the Impact of AI on the Growth of SMEs are more relevant and inter relationship with variables.

Impact of AI on the Performance of SMEs

1. Financial Performance
2. Productivity Enhancement
3. Customer Satisfaction
4. Employee Performance
5. Risk Management

Table No. 4
Impact of AI on the Performance of SMEs

Sl. No.	Variables	Less Impact	Normal Impact	High Impact	Total
1	Financial Performance	28 (46.67%)	20 (33.33%)	12 (20.00%)	60
2	Productivity Enhancement	16 (26.67%)	24 (40.00%)	20 (33.33%)	60
3	Customer Satisfaction	21 (35.00%)	32 (53.33%)	7 (11.67%)	60
4	Employee Performance	32 (53.33%)	20 (33.33%)	8 (13.34%)	60
5	Risk Management	11 (18.33%)	32 (53.33%)	17 (28.34%)	60

Source: Computed data

Financial Performance

Out of 60 samples, twenty eight (46.67%) employers felt less impact. Twenty (33.33%) employers felt normal impact and remaining twelve (20.00%) sample employers felt high impact. Majority (46.67%) of the sample respondents felt **less impact** of AI in financial performance. It concluded that AI is not playing major role in financial performance.

Productivity Enhancement

Out of 60 samples, sixteen (26.67%) employers felt less impact. Twenty four (40.00%) employers felt normal impact and remaining twenty (33.33%) sample employers felt high impact. Majority (40.00%) of the sample respondents felt **normal impact** of AI in enhanced decision making.

Customer Satisfaction

Out of 60 samples, twenty one (35.00%) employers felt less impact. Thirty two (53.33%) employers felt normal impact and remaining seven (11.67%) sample employers felt high impact. Majority (53.33%) of the sample respondents felt **normal impact** of AI in customer satisfaction.

Employee performance

Out of 60 samples, thirty two (53.33%) employers felt less impact. Twenty (33.33%) employers felt normal impact and remaining eight (13.34%) sample employers felt high

impact. Majority (53.33%) of the sample respondents felt **less impact** of AI in financial performance. It concluded that AI is not playing major role in financial performance.

Risk Management

Out of 60 samples, eleven (18.33%) employers felt less impact. Thirty two (53.33%) employers felt normal impact and remaining seventeen (28.34%) sample employers felt high impact. Majority (53.33%) of the sample respondents felt **normal impact** of AI in risk management. It concluded that AI is not playing major role in risk management.

Table No. 5

Correlation : Relationship between : Financial Performance, Productivity Enhancement, Customer Satisfaction, Employee Performance and Risk Management

		Financial Performance	Productivity Enhancement	Customer Satisfaction	Employee Performance	Risk Management
Financial Performance	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	60				
Productivity Enhancement	Pearson Correlation	.372	1			
	Sig. (2-tailed)	.121				
	N	60	60			
Customer Satisfaction	Pearson Correlation	.563	.811*	1		
	Sig. (2-tailed)	.271	.001			
	N	60	60	60		
Employee Performance	Pearson Correlation	.852**	.783**	.313	1	
	Sig. (2-tailed)	.001	.001	.173		
	N	60	60	60	60	
Risk Management	Pearson Correlation	.795**	.288	.137	.173	1
	Sig. (2-tailed)	.001	.271	.296	.228	
	N	60	60	60	60	60

*. Correlation is significant at the 0.05 level (2-tailed).

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

Employees' performance (0.852) and risk management (0.795) has positive and significant relationship with financial performance at 1% significant level.

Employees' performance (0.783) has positive and significant relationship with productivity enhancement at 1% significant level.

Customer satisfaction (0.811) has positive and significant relationship with productivity enhancement at 5% significant level.

SUMMARY OF FINDINGS

The following are the summary of findings of the study

1. Automation (robotics, CNC with AI), process optimization and intelligent scheduling reduce cycle times and increase throughput.

2. Condition-monitoring sensors + AI models predict failures (vibration, temperature), enabling planned repairs and longer MTBF.
3. Computer-vision systems find surface defects, dimensional errors and welding faults faster and more consistently than manual inspection.
4. Demand forecasting and inventory-optimization algorithms reduce stock outs and excess inventory especially valuable for spare parts and components.
5. AI optimizes motor control, process parameters and shop-floor scheduling to lower energy consumption per unit. Pump manufacturers (motors, test rigs) see direct savings.
6. Majority of the SMEs are highly aware of the AI technology.
7. AI adoption improves the operational efficiency and customer satisfaction.
8. The major barriers in implementing AI are the cost, lack of skilled manpower, and limited expertise.

SUGGESTIONS FOR THE SMES

The following are some of the suggestions given to the organisation management in implementing the AI in SMEs.

1. The SMEs should begin implementing Artificial Intelligence in specific areas such as customer service such as chatbots, data management, or inventory control before implementing to more complex operations.
2. The organization should arrange for training programs to develop employee awareness and technical skills in AI tools, data analytics, and automation. Skilled employees can help the organization make better use of AI applications in their operations.
3. SMEs should collaborate with AI solution providers, research institutions, or startups to gain access to advanced tools and technical expertise at affordable costs and in innovation and knowledge sharing.
4. SMEs should take advantage of government schemes such as the Digital MSME program and Startup India for grants, and digital transformation initiatives that promote AI adoption in the organisation.
5. AI systems heavily rely on data, so SMEs must protect the data quality, storage of sensitive data, and protection against cyber threats to maintain customer trust.
6. Employees should be encouraged to test AI-based solutions to enhance efficiency and customer satisfaction.
7. The performance of AI tools has to be measured the effectiveness in improving productivity, sales, and customer experience, which helps in making informed future investment decisions.
8. The hardware, software, and network systems have to be updated to support AI-powered applications to work effectively.
9. AI-driven business analytics could be used to understand the customer preferences, predict the market trends, and marketing strategies to increase the sales and to improve the customer trustworthiness.
10. SMEs should create a long-term roadmap to AI initiatives with their business goals to achieve sustainable growth, development, and competitiveness in the market.

CONCLUSION

The study on “The Impact of Artificial Intelligence on the Growth and Performance of Small and Medium Enterprises (SMEs) in Coimbatore” has given an insight in the performance of the organisation after the implementation of the AI in SMEs in automation, decision-making, business analytics, market research, and customer satisfaction. Though there are barriers in implementing AI in SMEs like cost, unskilled employees, rules and regulations, data quality, and cultural resistance, implementing AI for potentials to transform SMEs by improving efficiency, reducing costs, and enabling innovation in organisation. Since government also supports implementing AI in SMEs by providing grants and supports from AI providers, SMEs

can implement AI in all the operations in their organisation. Finally, by creating awareness among the employees, training in AI technologies, support from government, partnering the AI providers, AI could be implemented successfully in SMEs in the digitally transformed world.

REFERENCES

1. Anuj Kumar, D. (2022). A study of barriers and Benefits of Artificial Intelligence Adoption in Small and Medium Enterprise. *Academy of Marketing Studies Journal*, 8(1), 8.
2. Mari Selvam P (2013). Progress and Performance of Micro, Small and Medium Enterprises in India. *International Journal of Management and Development Studies*, 2(4), 11-16.
3. Paramasivan. C, Mari Selvam. P (2016), Socio economic status of Dalit entrepreneurs in Tamil Nadu , *Economic Challenger*, Volume 72, issue 18, page 67-75.
4. Pasupathi R (2017), A study on growth and performance of Indian agro based exports, *International Journal of Humanities and Social Science Research*, Volume 3; Issue 9; September 2017; Page No. 01-05.
5. Sara I. C. Lemos, F. A. (2022). Artificial intelligence and change management in small and medium sized enterprises: an analysis of dynamics within adaptation initiatives. *Springer Nature - PMC COVID-19 Collection* , 1(4), 27. DOI: <https://link.springer.com/article/10.1007/s10479-022-05159-4>
6. Wang, Y. (2022). *The Impact of Fintech on SMEs Financing*. Sydney: Atlantic press. DOI: <https://doi.org/10.2991/aebmr.k.220405.074>