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THE IMPACT OF ARTIFICIAL INTELLIGENCE ADOPTION ON THE PERFORMANCE OF SMALL AND MEDIUM-SIZED ENTERPRISES: EVIDENCE FROM UZBEKISTAN

Batoshova Madina Aminovna

Fourth-Year Undergraduate Student

Economics and Management in the Field of Information and Communication Technologies

Tashkent University of Information Technologies, Tashkent, Uzbekistan

Abstract

Artificial Intelligence (AI) has become a strategic technology that enables businesses to improve operational efficiency, reduce costs, enhance decision-making, and strengthen competitiveness. Although AI adoption has accelerated globally, its implementation among small and medium-sized enterprises (SMEs) in developing countries remains limited. This study examines the impact of AI adoption on SME performance in Uzbekistan and identifies the key opportunities and challenges associated with its implementation.

The study employs a qualitative research approach based on a systematic review of recent academic literature and reports published by international ***organizations between 2026 and 2026. The analysis is guided by the Technology-*** Organization–Environment (TOE) framework and the Resource-Based View (RBV) theory to explain the relationship between AI adoption and enterprise performance.

The findings suggest that AI adoption improves productivity, operational efficiency, innovation capability, and customer satisfaction while reducing operating costs and supporting data-driven decision-making. However, inadequate digital infrastructure, limited financial resources, shortages of qualified specialists, and insufficient organizational readiness remain significant barriers to AI implementation among Uzbek SMEs.

The study concludes that strengthening digital infrastructure, promoting AI-related skills, and expanding cooperation between government, universities, and the private sector are essential for accelerating AI adoption and improving SME competitiveness in Uzbekistan.

Keywords: Artificial Intelligence; SMEs; Digital Transformation; Business Performance; Innovation; Productivity; Uzbekistan.

Introduction

Small and medium-sized enterprises (SMEs) are widely recognized as the backbone of economic development, accounting for a significant share of employment, business activity, and economic growth worldwide. According to the World Bank, SMEs represent nearly 90% of all businesses and contribute substantially to job creation and national income in both developed and developing economies [1]. Their ability to adapt to technological change is therefore essential for achieving sustainable economic development.

The rapid development of Artificial Intelligence (AI) has transformed the way businesses operate. AI technologies, including machine learning, natural language processing, predictive analytics, and intelligent automation, enable firms to optimize business processes, improve decision-making, and increase productivity [2]. As a result, AI is increasingly viewed as a strategic resource that enhances organizational competitiveness rather than simply a technological innovation.

For SMEs, AI offers considerable opportunities to automate routine tasks, improve customer relationship management, optimize supply chains, and support data-driven business decisions. These advantages can help smaller firms overcome resource limitations and compete more effectively in dynamic markets [3]. However, successful AI implementation requires adequate technological infrastructure, financial investment, skilled human resources, and supportive institutional policies.

In recent years, Uzbekistan has introduced several initiatives aimed at promoting digital transformation and technological innovation. National programs supporting digitalization, together with the expansion of IT infrastructure and innovation ecosystems, have created favorable conditions for AI development. Nevertheless, AI adoption among SMEs remains at an early stage due to financial constraints, limited technical expertise, and uneven digital readiness across industries [4].

Although previous studies have extensively examined AI adoption in developed economies, relatively little research has focused on its impact within emerging economies, particularly in Central Asia. Consequently, there is limited evidence regarding how AI influences SME performance under Uzbekistan's economic and institutional conditions.

This study aims to assess the impact of Artificial Intelligence adoption on the performance of SMEs in Uzbekistan by analyzing recent international evidence and identifying the main factors affecting AI implementation. The findings are expected to provide practical recommendations for policymakers and business leaders seeking to accelerate digital transformation and enhance SME competitiveness.

Materials and Methods

This study employed a qualitative research design based on a systematic review of recent literature to examine the impact of Artificial Intelligence (AI) on the

performance of small and medium-sized enterprises (SMEs) in Uzbekistan. Relevant publications indexed in Scopus and Web of Science, together with reports from the World Bank, OECD, UNCTAD, UNDP, and official statistics from Uzbekistan published between 2017 and 2026, were reviewed.

The literature was selected according to three criteria: (1) relevance to AI adoption and SME performance, (2) publication within the last ten years, and (3) availability in peer-reviewed journals or official institutional reports. The collected data were analyzed using descriptive, comparative, and content analysis methods. The Technology–Organization–Environment (TOE) framework and the Resource-Based View (RBV) were applied to interpret the findings and explain the factors influencing AI adoption.

Results

The analysis demonstrates that AI adoption has a positive influence on SME performance. Businesses implementing AI technologies benefit from faster decision-making, improved operational efficiency, lower administrative costs, and better customer service. AI-powered tools also enhance demand forecasting, inventory management, and marketing effectiveness, allowing firms to respond more quickly to market changes.

Despite these advantages, AI adoption among SMEs in Uzbekistan remains relatively low. The main barriers include limited financial resources, insufficient digital infrastructure, a shortage of qualified specialists, and low awareness of AI applications among business owners. Furthermore, concerns regarding data security and implementation costs reduce the willingness of many enterprises to invest in AI technologies.

Overall, the findings suggest that while AI offers significant opportunities for improving SME competitiveness, its successful implementation depends on the availability of technological, financial, and human resources.

Discussion

The findings are consistent with previous international studies indicating that AI enhances organizational productivity, innovation, and competitiveness. AI enables SMEs to automate routine operations, improve strategic planning, and strengthen customer relationships through data-driven decision-making. These advantages contribute to higher business performance and greater adaptability in competitive markets.

However, the results also indicate that technological readiness alone is insufficient. Organizational capabilities, skilled employees, and supportive government policies are equally important for successful AI adoption. Similar challenges have been reported in other developing economies, suggesting that financial support, digital skills development, and innovation policies remain essential for accelerating AI implementation among SMEs.

For Uzbekistan, expanding digital infrastructure, strengthening university–industry collaboration, and improving access to affordable AI solutions could significantly increase the adoption of AI technologies within the SME sector.

Conclusion

Artificial Intelligence has considerable potential to improve the efficiency and competitiveness of SMEs in Uzbekistan. The study shows that AI adoption contributes to higher productivity, improved decision-making, cost reduction, and increased innovation capacity. Nevertheless, financial constraints, inadequate

digital infrastructure, limited technical expertise, and organizational challenges continue to hinder wider implementation.

To accelerate AI adoption, policymakers should promote digital infrastructure development, expand AI education and training programs, provide financial incentives for technology adoption, and encourage collaboration between universities, research institutions, and private enterprises.

Future studies should employ empirical methods using survey data from Uzbek SMEs to quantitatively evaluate the relationship between AI adoption and business performance.

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