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Small and Medium Enterprises & Artificial Intelligence: A Systematic Literature Review

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Abstract

The growth of the world is incredibly reliant on small and medium-sized enterprises (SMEs) that promote innovation. SMEs are also challenged by a shortage of resources, stiff competition and intricate market environments. To a greater extent, they are surmounting these hurdles by using Artificial Intelligence (AI) and Machine Learning (ML) technologies to streamline the work of laborers, make better decisions and enrich customer experience. The research on how AI and ML integrate in SMEs and their effects on business performance will be explored. The body of the present study relied on a systematic literature review methodology designed to estimate the advantages, constraints, and use of AI and ML in 4 major business areas: supply chain management, marketing, finance, and customer service, and ethical and social implications. The moral and social impacts of all the above can be mentioned regarding how AI and ML contribute to SMEs' competitiveness and sustainability. With the help of successful case studies and the results of the literature research, this paper reveals how AI and ML promote innovation and sustainable growth. Despite the numerous advantages, barriers including technological ignorance, costly implementation, and privacy and protection of information are challenges impeding the SMEs. To eliminate such problems, the paper gives great attention to cooperation with the providers of technology, personnel education, and attention to data security. The study is part of the literature about AI and ML implementation within the SME sector since it specifies the key strategies to succeed in any competitive environment.

Keywords

Artificial intelligence, machine learning, SMEs, FinTech, Sustainability

Introduction

SMEs drive global economic growth. SMEs are crucial to industrialization, employment, and financial stability in emerging nations like India. The global workforce is two-thirds composed of SMEs, which account for 99% of the global active company activities, 50% to 60% of global economic activity, and two-thirds of the global workforce (Haroon et al., 2024; Kalsom, 2021).

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Definition of SMEs and MSMEs

The terms SMEs and MSMEs are interchangeable. Therefore, this must be clarified since these two words have national or international meanings. tiny and Medium-sized Enterprises (SMEs) are tiny businesses based on income, assets, or workers. The EU classifies SMEs as micro (less than 10 workers), small (10 to 50), and medium-sized (50 to 250). SMEs in most industrialized nations are categorized by revenue and number of workers to determine eligibility for government policies and programs that help them (European Commission, 2020). MSMEs, on the other hand, have a larger category that includes micro firms. Micro Enterprises tend to have fewer than 10 employees and a smaller annual turnover or balance sheet than SMEs. MSMEs in underdeveloped nations like India are classified as micro if they have fewer than 10 workers or a revenue of less than INR 2.5 million. Small, 10-50 employees, INR 2.5 million to 50 million sales, and medium, 50-100 employees, INR 50 million to 250 million (Government of India, 2017). This difference is important since MSMEs face obstacles and possibilities based on national legislation, money, and government efforts that encourage development and innovation. SME refers to organizations with a reasonable number of workers and turnover, although MSE includes micro-enterprises that may get grants and access funding under other restrictions. Additionally, SMEs and MSMEs have varied definitions in different nations, which affects research on these organizations. In India, MSMEs are intimately linked to government policy and support. Still, SMEs might imply any firm, even a big one, that does not meet MSME standards. This study focusses on SMEs, however MSMEs may intersect with SMEs in certain scenarios. However, their size, scale, and national backing characterize these organizations.

Problem Statement

SMEs struggle to compete in the global market due to limited financial bases, management systems, and operational development. In recent times, AI and ML have become attractive answers to these problems. Technology may help SMEs automate operations, improve decisions, and satisfy consumers for long-term sustainability and competitiveness. This research analyses SME AI-ML integration. SCM, marketing, finance, and customer service were examined. These areas assist SMEs compete in the digital economy. Supply chain logistics, demand planning, and stock-keeping unit management benefit from AI. SMEs may save money, enhance service, and forecast supply chain disruptions using AI as predictive analytics (Soomro et al., 2025). AI is becoming more significant in SCM as SMEs struggle to catch up to bigger enterprises with better systems. SMEs may tailor marketing and engage customers using AI solutions including customer segmentations, recommendation engines, and predictive analytics. These technologies enable SMEs reach customers, boost sales, and establish loyalty (Liu et al., 2021). AI will boost SME marketing and customer engagement. For financial forecasting, risk management, and capital planning, finance SMEs may employ AI and machine learning. Data-driven solutions optimize SME economic activity and resource allocation (Farmanesh et al., 2025). Finance AI is changing how SMEs analyze financial risks and plan long-term. Automation, response speed, and customer experience are improved by chatbots and virtual assistants in customer support. Achuthan et al. (2025) propose AI-powered customer care assistance for 24/7 help, fast query response, and enhanced SME client experience. Digitalization and the requirement for SMEs to compete worldwide have made AI

and ML adoption increasingly important. This study will extensively examine how AI and ML are impacting four main business areas. This research will investigate current literature and case studies to assess SMEs' AI and ML implementation prospects and obstacles and the ethical and social ramifications of their massively scaled usage.

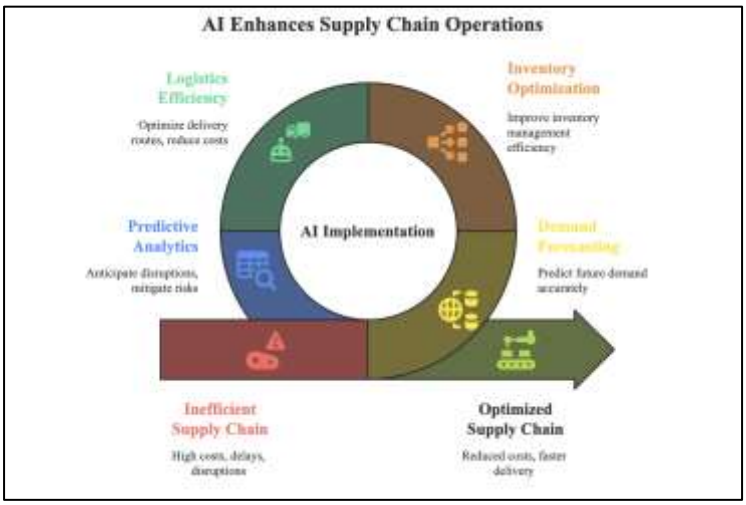

Figure 1. Artificial Intelligence adoption in Supply Chain Operations
Sources: Author's Own Complication

Methodology

In SMEs, AI and ML are crucial to supply chain management, marketing, finance, and customer service. This article examines their significance. Systematic literature reviews use PRISMA technique, which is well-established in evidence-based systematic reviews and meta-analyses. Evidence-based reporting's restricted data-gathering allows systematic reviews and meta-analyses to forecast SME issues. The search method was developed after determining the research topic using search phrases and strings. Developing inclusion and exclusion criteria led to selecting relevant research articles from the literature. Pre-formed study questions guided data extraction. The study gave solutions with limitations, opportunities, and challenges for this area. Following subsections describe the phases in succession.

Research Question

The introduction has well-outlined research questions that will guide the investigation and also provide a basis on which the study is identified. The following are these questions:
RQ1: What are the most prevalent AI and ML methods used by SMEs in the adoption of FinTech?
RQ2: How is the provision of FinTech services in SMEs in different countries currently standing?
RQ3: What are the main aspects of the uses of FinTech solutions by SMEs?
RQ4: What are the potential challenges and opportunities SMEs can have when using FinTech solutions?
These questions inform the systematic review, as responses to these questions revolve around how AI and ML are used in the SME operation, especially in FinTech.

Search Strategy

The search strategy was drawn to enable the understanding of the relevant research in established databases. The initial search used four major databases: Web of Science, IEEE Xplore, Springer, and ACM Digital Library. The works published between January 1, 2020, and April 8, 2025, were included so that the information could be relevant and topical. Keywords used in search included: *"SME or MSME and FinTech or Financial Technology and Artificial Intelligence or Machine Learning"*

The output of every database was sifted to contain only pertinent articles that touched on AI, ML and their usage in SMEs, specifically in FinTech.

Table 2: Search Strategy

Database	**Number of Papers Found**
ACM Library	608
IEEE Xplore	10
Web of Science	1768
Springer	335
Total	**2721**

Inclusion and exclusion criteria:

Inclusion Criteria:

IC1: Documents should be related to the use of FinTech in SMEs.
IC2: The requirements are that the papers should be published on ScienceDirect, Springer, IEEE Xplore, and ACM Digital Library.
IC3: Deployments of the publications placed in the period between January 1, 2020, and April 8, 2025.
IC4: Research articles should have in the title, abstract or keywords the words FinTech, SME or MSME.
IC5: The use of ML and AI in the SME services should be described in the documents.

Exclusion Criteria:

EC1: Research articles not published in English.
EC2: Secondary research, demonstration articles, or opinion column articles.
EC3: Articles published prior to January 1, 2020.
EC4: Investigations that have nothing to do with AI or ML in SMEs.
EC5: Research articles that do not provide methodological explanations or obvious details that support the research questions.

Study Selection

Following the execution of the original search query, every article was obtained and subjected to PRISMA analysis. The PRISMA analysis was applied to the papers identified because of the search. Once the duplicates were screened out, 355 studies were omitted. A second-level screening was done on abstracts and titles, which led to the omission of 401 papers considered not relevant to the scope of the study. This narrowed down to 333 papers that were read carefully, which gave the idea of employing AI and ML in SMEs through the diverse areas of operation, supply chain, marketing, finance, and customer service. The decision-making procedure following the PRISMA recommendations is shown in Figure 2.

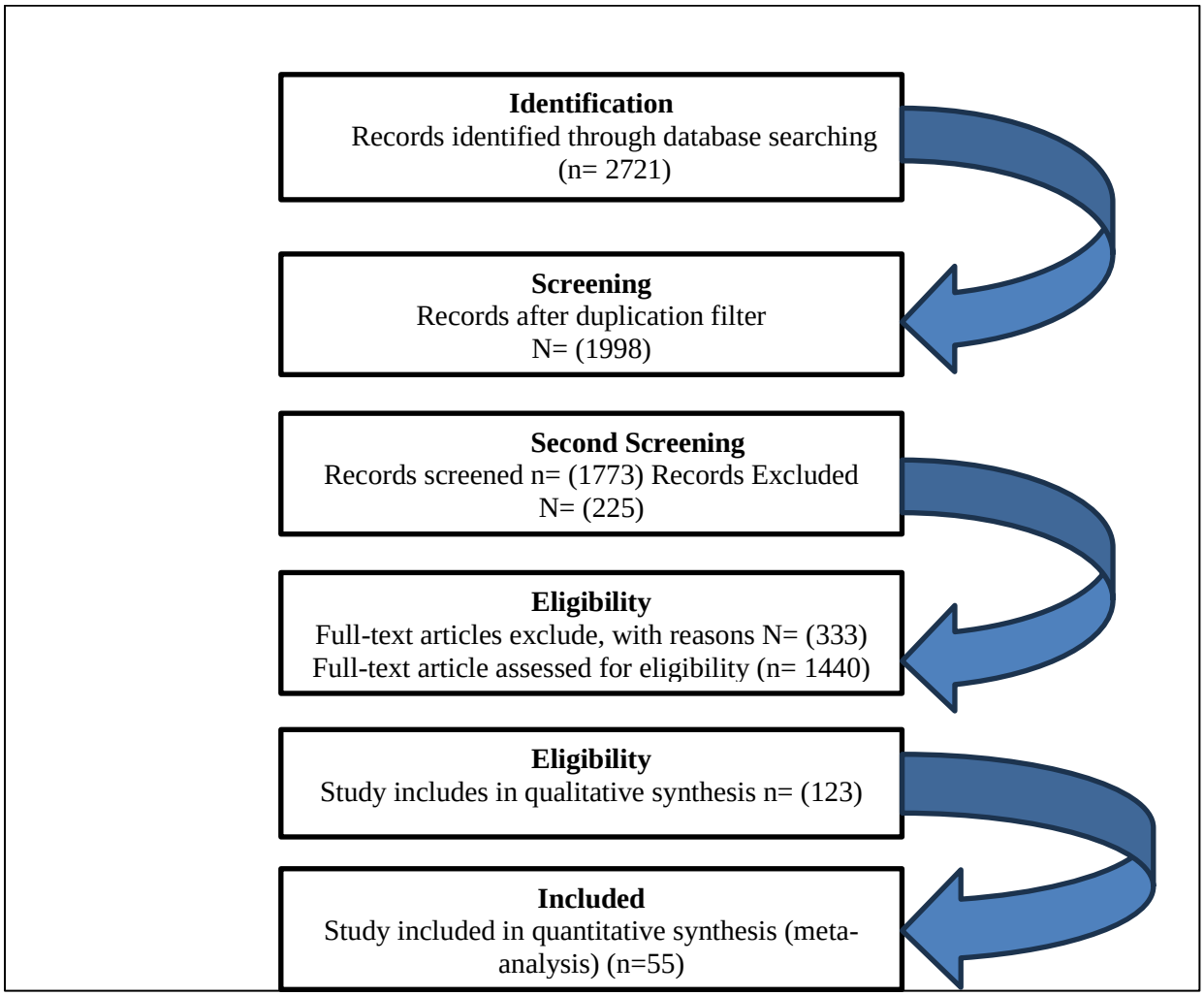

Figure 2: PRISMA Flow Diagram
Sources: Author's Own Complication

Extraction of study characteristics

The critical articles were extracted from the selected published articles for analysis. To conduct the systematic literature review, the following information was extracted:

1. Article author details, article title, and abstract

2. Year of publication and associated database
3. Focus on the application and geographical area
4. SME problems, regulatory compliance, and credit risk assessment
5. AI, technology adoption areas, investment criteria, sources
6. Machine learning technology

Immediately after data extraction, the corresponding articles were thoroughly reviewed and synthesized to find the solutions to the pre-established research queries.

Methodological Refinement

The search approach targeted SMEs and included MSMEs for research that might cover both small and medium-sized firms due to the uncertainty concerning MSMEs. The inclusion criterion (IC1) term FinTech encompasses more financial technology applications. SCM, marketing, and customer service are some of the FinTech solutions a SME may get. However, it may not be considered financial industry in scope.

Risk of Bias

Systematic reviews' main weakness is presumptions, which make them subjective. First, choosing the main keywords or string for a database search introduces bias. Additionally, the authors' subjective qualification requirements raise screening bias. The search only includes Web of Science, Springer, ACM Library, and IEEE. Still, the researchers sought to finish this systematic review employing the best PRISMA-recommended characteristics and methodologies. Numerous assessments of AI deployment in SMEs by earlier researchers did not address this paper's study questions. The research community needs this review since it covers all these crucial aspects.

Results and discussion

The systematic literature review discusses how AI and ML are being used in small and medium-sized enterprises (SMEs), particularly in supply chain management (SCM), marketing, finance, and customer service. The criticism utilizes study goals from the introduction to examine how relevant the results are and how they may help SMEs. Table 1 shows that small enterprises' poor technology utilization contributes to the lack of research on growing countries like Bangladesh, Nepal, and India. Most people in these locations still amass money by conventional ways or manufacture commodities, thus writers must aggressively construct financial technology resources that will enable most people to utilize technology for simple and rapid financial consumption and accumulation.

Table 1: Country-wise distribution of included publications

Country	TC
USA	111
South Africa	105
Indonesia	74
Pakistan	64
Bangladesh	48
Canada	31
Australia	17

United Kingdom	16
Hong Kong	14
China	12
United Arab Emirates	11
Italy	10
Estonia	9
Poland	7
Hungry	4
India	3
Brunei	2
Malaysia	2
Thailand	2
Kazakhstan	1

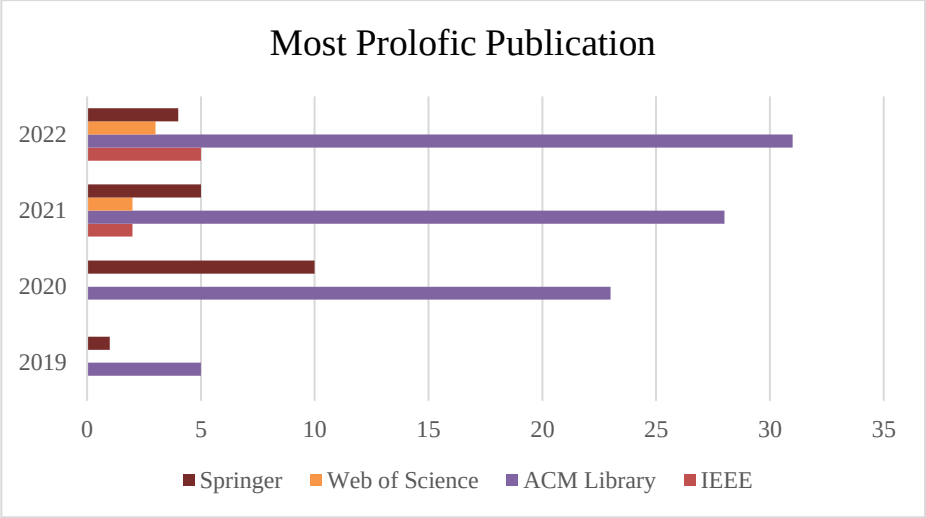

Figure 3: Year-Wise Distribution of Papers from the Four Databases

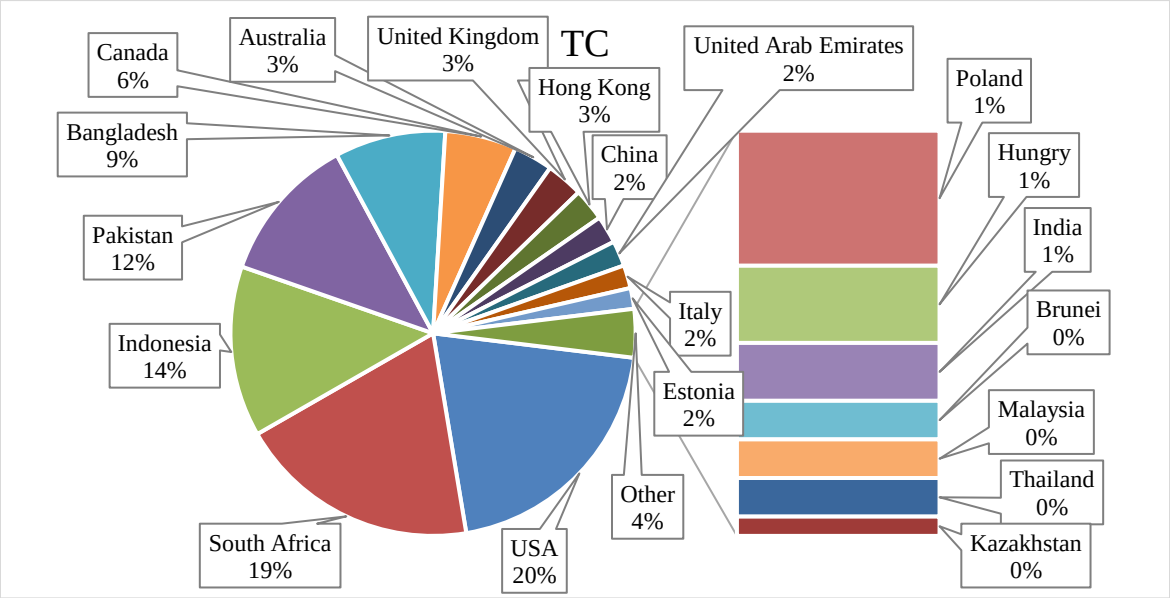

Figure 4: Country-wise distribution of included publications

Answer to RQ1

SMEs' FinTech implementation methods using AI and ML are examined in the initial study (Siswoyo et al., 2020). The research consists of two sections: (1) AI technology and (2) freshly discovered ML approaches. SME FinTech solution adopters use supervised and unsupervised AI machine learning algorithms. This research examines SMEs' most popular AI and ML FinTech implementation methods (Tanane et al., 2025; Khan, 2022). The literature study indicated that SMEs employ AI and ML most in FinTech, including predictive analytics, supervised and unsupervised machine learning models, and other AI-based methodologies. SMEs use predictive analytics to estimate client demand, financial resources, and operations, making it the most popular AI compassionate. FinTech solutions identify fraud and segment customers using supervised machine learning like decision trees and neural networks. These models enable SMEs interact with large volumes of data, discover patterns, and utilise data to make choices and grow their company (Chatterjee et al., 2022). Unsupervised machine learning methods like the clustering algorithm can find a hidden structure in the data, which helps SMEs understand customer behavior and isolate data into specific groups for targeted marketing campaigns. SCM uses AI, especially predictive analytics, to detect supply chain failures and optimize inventories. ML models estimate demand and adjust inventories to improve logistical efficiency. These AI solutions help SMEs compete with faster, cheaper supply chain processes.

Answer to RQ2

This research evaluates FinTech services in international SMEs. Due to operational ecosystem maturity and implementation rules, financial technologies are deployed differently globally. FinTech excites Indian SMEs. FinTech solutions improve SMEs' operational efficiency and financial availability, making them more competitive, according to Carayannis et al. 2025. The findings found that FinTech implementation levels vary widely by area. The US and Singapore have the highest FinTech adoption rates, with 40% and 55% of SMEs using these technologies, respectively. These countries have strong digital infrastructures, favorable government policies, and increasing financial inclusion (Thomson et al., 2022). In growing countries like India, queueing is turning towards FinTech, specifically digital payment systems and peer-to-peer frameworks. Indian SMEs may now access cash more easily with AI-based credit-scoring systems, and digital accounting services have improved financial management (Anglekar et al., 2021). Only 10% of SMEs in South Africa and Saudi Arabia can use FinTech services (von Garrel & Jahn, 2022; Enshassi et al., 2025). These regions need better infrastructure and government support to promote FinTech (Zamani, 2022). These findings suggest that FinTech adoption is strongest in developed economies and that geography is a crucial factor. Emerging markets follow as digital infrastructure and banking technology become accessible.

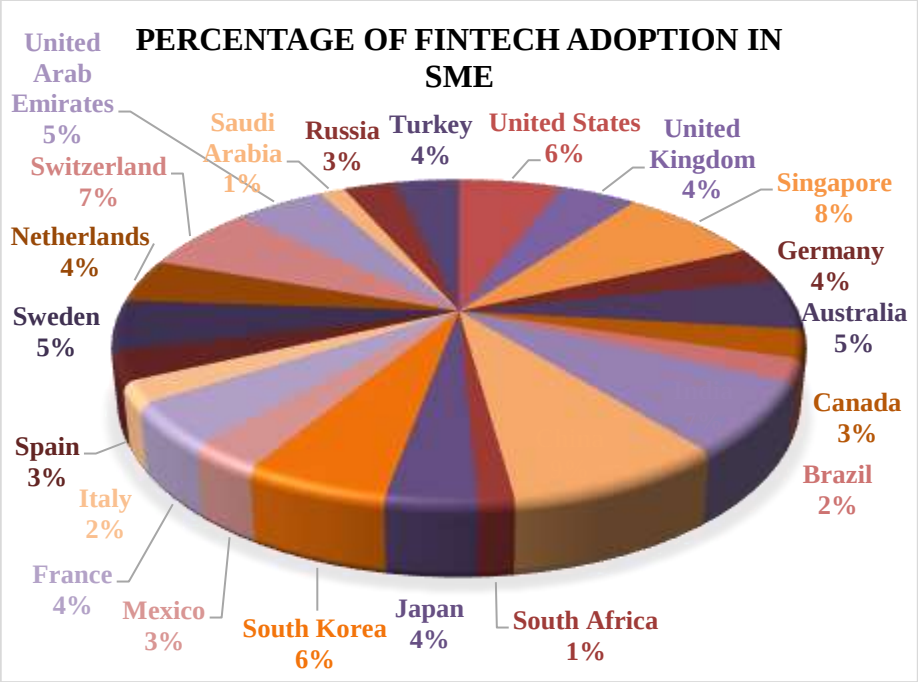

Figure 5: Fintech adoption in various countries

Answer to RQ3

FinTech application use among SMEs is evaluated to determine their primary deployment areas at operational and growth phases. FinTech apps help SMEs innovate and improve efficiency. The analysis found the following crucial areas where SMEs are utilizing FinTech solutions:

- *Transaction and Payment Systems:* Mobile wallets and payment gateways will change SME and P2P lending systems. These methods simplify payments, improve cash management, and reduce financial system reliance. This helps SMEs make cross-border payments easily, expanding their market reach and efficiency (Krey et al., 2022).
- *Availability of Finance:* FinTech solutions boost SMEs' access to cash, particularly peer-to-peer lending and crowdfunding platforms. Data-driven ways of analyzing the risks of providing capital to borrowers and speedier matching firms to lenders circumvent the problems SMEs have in getting bank loans (Yuan et al., 2025).
- *The use of E-Commerce and Online Marketplaces*: FinTech facilitates the opening of online stores, and SMEs can easily manage stock. Like payment and inventory management, SMEs could access international markets and gain competitive advantages in electronic transactions (Wei & Pardo, 2022; Sastararuji et al., 2021; Alexandrova & Zabolotskaya, 2021).
- *Risk Management and Fraud Prevention*: ML and AI models are finding massive application in increasing fraud detection levels and risk management amongst SMEs. Transactional data analyzed with the help of these technologies can detect patterns that signal fraud and alert in real-time; thus, avoiding the financial costs of fraud (Baabdullah et al., 2021).

Answer to RQ4

This research issue investigates SMEs' FinTech implementation hurdles and potential for overcoming problems and stimulating sustainable growth. How SMEs overcome these major obstacles offers several FinTech potential to boost company development and competitiveness. Besides SMEs' possibilities, the research found other FinTech adoption barriers:

- ***Availability of Capital:*** Most SMEs face challenges in accessing capital in terms of credit history and the inability to provide collateral as a source of business capital. Nevertheless, FinTech services, including P2P lending, microfinance, and corporate, are starting to give alternative sources of finance that enable SMEs to have the finance they need to expand (Elia et al., 2020; Meiryani et al., 2021).
- ***Technology Investment and Infrastructure:*** This is another obstacle in the shortage of technology investment and infrastructure, combined with talent. The SMEs face difficulties in trying to invest in the required technology. Nevertheless, SMEs increasingly find a way to overcome these impediments through the implementation of AI and ML technologies as they become more cost-effective and accessible to businesses (Drydakis, 2022; Lammers et al., 2022).
- ***Regulatory Compliance:*** Another issue SMEs have is the challenge of dealing with the complex and often unstable regulations. FinTech solutions, in turn, promise to facilitate the process of tax calculation, financial reporting, and meeting the standards of its segment, thus lowering the administrative costs and guaranteeing compliance with the regulations.
- ***Talent Acquisition and Retention:*** Acquiring talented individuals also poses a big challenge. With the help of the employed training programs and competitive compensation packages, SMEs are more likely to overcome this impediment and create a skilled workforce to execute AI and ML technologies (Popkova & Sergi, 2020; Fossen & Sorgner, 2021; Corvello et al., 2022).

Theoretical & Practical Contribution

The proposed study will address literature gaps by providing an academic contribution to the findings and research efforts in adopting AI and ML use in SMEs, considering applications of both in the most crucial business sectors, namely SCM, marketing, finance, and customer service. It highlights the significance of decision-making based on data, better customer interaction, and efficiency in the growth of SMEs. This practical research delivers direct recommendations that help SMEs use AI and ML technologies effectively. On a practical level, the study points to the necessity of SMEs to invest in digital infrastructure, deploy AI and ML technology, and make sure they comply with regulatory frameworks. Policymakers and business executives should also develop an environment conducive to these technologies by providing resources, training and support in regulations to enable the SMEs to flourish in the digital economy.

Conclusion

The study groups SME AI and ML applications. Researchers searched ACM Library, IEEE, Web of Science, and Springer databases for academic papers that met study goals and eligibility requirements. FinTech is important because rising countries utilize outmoded industrial, supply, and financial acquisition systems. To flourish in the market, SMEs must use AI and ML. According to the research, AI and ML may help SMBs optimize operations and

uncover development prospects. Several SMEs show that AI and ML technologies transform decision-making, customer experiences, supply chain operations, and marketing. Technology helps SMEs enhance operational performance, decrease costs, boost productivity, and compete. Automation, prediction, and personalization boost customer loyalty. The poll says SMEs need it. AI and ML algorithms help SMEs analyze large structured and unstructured data for insights and market adaptation. SMEs may utilize data to detect hidden patterns and abnormalities for digital success. SMEs have challenges using AI and ML, yet evidence reveals their benefits. SME AI/ML integration requires earthquake resolution. These technologies can only be maximized by SMEs with technological resources, legislation, and skilled instruction. This study implies AI and ML might help SMEs grow sustainably. These technologies boost SMEs' competitiveness, digital economy management, and potential. As competition and digitalization grow, AI and ML will help SMEs. AI-ML technology adoption by governments, business leaders, and academia may benefit SMEs.

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