ARTIFICIAL INTELLIGENCE AS A TOOL FOR MANAGEMENT IMPROVEMENT IN ENTREPRENEURIAL ENTITIES UNDER DIGITAL TRANSFORMATION

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Abstract

This article examines artificial intelligence as a tool for improving management in entrepreneurial entities under conditions of digital transformation. In today's business environment, entrepreneurial organizations are expected to make faster decisions, personalize customer interaction, optimize operations, manage risk more effectively, and innovate continuously. Artificial intelligence has emerged as a strategic instrument that can support these goals by enhancing data analysis, forecasting, automation, and decision support. However, the managerial value of AI depends not only on technology adoption, but also on strategic alignment, organizational readiness, process redesign, and ethical governance. This study uses a qualitative review-based methodology grounded in academic literature and recent international institutional sources. The analysis shows that AI can improve management across key functional areas such as strategic planning, marketing, finance, human resources, operations, and customer service. At the same time, it identifies major barriers including skill shortages, fragmented data systems, cost constraints, governance risks, and uneven adoption between large and small firms. The article proposes an integrated framework for using AI in entrepreneurial management built on five pillars: strategic governance, data infrastructure, capability development, process integration, and responsible performance management. It is concluded that AI can become a powerful instrument of managerial improvement when it is embedded into a broader digital transformation strategy rather than used as an isolated technical solution.

Key words: artificial intelligence, entrepreneurial entities, digital transformation, management improvement, business innovation, decision support,

digital strategy, AI governance

Introduction

Digital transformation has changed the logic of management in entrepreneurial entities. Firms are increasingly expected to respond to real-time market signals, process growing volumes of data, reduce operational frictions, and innovate under intense competitive pressure. In this context, artificial intelligence has moved from being a specialized technological field to becoming a practical managerial instrument. Recent OECD evidence shows that AI adoption by firms has continued to expand rapidly: in 2025, 20.2% of firms in OECD countries reported using AI, up from 14.2% in 2024 and 8.7% in 2023. At the same time, OECD materials emphasize that firms adopting AI can improve productivity and operational outcomes, although adoption remains uneven across firm sizes and sectors.

The relevance of AI for entrepreneurial entities is especially high because such entities typically operate with resource constraints, rapid growth ambitions, and strong market orientation. AI tools can support entrepreneurs and business managers in forecasting demand, segmenting customers, automating workflows, improving financial analysis, and identifying new opportunities. Yet international evidence also shows that AI gains are not automatic. The World Bank's 2025 report on AI foundations and UNCTAD's 2025 technology report both stress that the benefits of AI depend on broader readiness conditions such as infrastructure, skills, institutional capacity, and the ability to integrate AI into productive systems.

Another important reason for studying this topic is the growing strategic importance of AI within innovation ecosystems. WIPO's recent materials show that innovation and AI-related technological activity continue to expand, while generative AI is rapidly spreading across application areas. This means that entrepreneurial entities are increasingly competing in an environment where AI is not only an efficiency tool but also a source of differentiation, business-model change, and innovation advantage.

The aim of this article is to analyze how artificial intelligence can improve management in entrepreneurial entities under digital transformation. The paper reviews the theoretical foundations, identifies the main areas of managerial

application, analyzes the benefits and risks, and proposes a practical framework for effective implementation.

Literature Review

The general literature on digital transformation provides the first conceptual foundation for this topic. Vial (2019) explains that digital transformation is a process in which digital technologies trigger substantial changes in value creation, organizational structures, and strategic responses. This is important because it suggests that AI should not be treated merely as a software addition; instead, it must be understood as part of a broader reconfiguration of how firms are managed and how decisions are made.

A second key theoretical perspective is the dynamic capabilities approach. Warner and Wäger (2019) argue that digital transformation requires ongoing strategic renewal based on an organization's ability to sense opportunities, seize them, and reconfigure internal resources. Ellström et al. (2021) further show that digital transformation depends on leadership, coordination, and organizational capability rather than on technology alone. This is especially relevant for AI because the managerial value of AI appears only when firms develop the capacity to absorb insights, redesign processes, and act on new information.

Recent OECD work deepens this discussion by focusing specifically on AI adoption in firms. OECD publications from 2024 and 2025 note that AI can raise labor productivity, lower defect rates, improve efficiency, and support broader business improvement. However, these sources also stress that AI adoption remains relatively low compared with other digital technologies, and that larger firms generally adopt AI more quickly than smaller ones. For SMEs across OECD countries, the share of firms using AI rose from 5.6% in 2020 to 14% in 2024, indicating clear momentum but also showing that diffusion is still incomplete.

The broader global literature also highlights structural constraints. UNCTAD's 2025 Technology and Innovation Report shows that AI development remains highly concentrated across countries and companies, while digital infrastructure gaps may widen inequality in access to AI-driven opportunities. The World Bank's 2025 Digital Progress and Trends Report likewise stresses that AI offers significant opportunities for jobs and productivity but requires strong

foundations to be deployed at scale. These findings imply that entrepreneurial entities cannot rely on AI tools alone; they need digital maturity, organizational readiness, and governance capacity.

Research Methodology

This article uses a qualitative review-based methodology. The research is based on the structured examination of academic and institutional literature concerning artificial intelligence, digital transformation, entrepreneurial management, productivity, innovation, and organizational capabilities. The selected sources include peer-reviewed studies and publications from international organizations such as the OECD, World Bank, UNCTAD, and WIPO.

The methodological procedure consisted of four stages. First, relevant literature was selected according to thematic relevance, analytical credibility, and applicability to entrepreneurial management. Second, the selected materials were coded around recurring themes, including strategic decision-making, operational efficiency, marketing analytics, financial management, capability development, and AI governance. Third, the literature was compared in order to identify converging patterns across different sectors and institutional contexts. Fourth, an integrated framework was developed to explain how entrepreneurial entities can use AI as a tool for management improvement.

This study does not present a primary survey or an econometric model. Its contribution is conceptual and practical: it synthesizes fragmented findings into a coherent model that can be used in academic work, dissertation writing, and business diagnostics.

Analysis and Results

1. Why AI matters for entrepreneurial management

Entrepreneurial entities operate in environments characterized by uncertainty, speed, competition, and resource constraints. Unlike large bureaucratic firms, they often need to make decisions with incomplete information and limited managerial capacity. AI is particularly valuable in such settings because it can expand the analytical power of managers and reduce the cost of complex information processing.

From a management perspective, AI improves three major functions. First, it strengthens decision quality by identifying patterns in data that are difficult to detect manually. Second, it enhances operational efficiency through automation and optimization. Third, it supports strategic adaptability by enabling faster forecasting, scenario analysis, and market sensing. OECD evidence that AI-using firms can outperform non-users in productivity and operational outcomes supports this managerial interpretation.

2. Main areas of managerial application

AI can improve management across multiple functional areas of entrepreneurial activity.

In strategic management, AI can support market forecasting, competitor monitoring, scenario simulation, and strategic prioritization. It helps managers process large data sets from market trends, customer feedback, pricing movements, and external signals.

In marketing and sales, AI can improve customer segmentation, personalization, campaign optimization, lead scoring, and churn prediction. Entrepreneurial entities can use AI to improve customer acquisition efficiency while using fewer resources.

In financial management, AI can support cash-flow forecasting, anomaly detection, credit assessment, expense categorization, and fraud-risk monitoring. These functions are especially useful for entrepreneurial firms that need tighter control over liquidity and resource allocation.

In operations and supply-chain management, AI can improve inventory planning, demand forecasting, defect detection, workflow automation, and scheduling efficiency. OECD materials note that AI can lower defect rates and reduce material waste in production-related contexts.

In human-resource management, AI can assist with recruitment screening, workforce planning, skills mapping, and training personalization. However, this area also creates significant ethical concerns, which means managerial controls are essential.

Table 1.

Main managerial uses of ai in entrepreneurial entities

Functional area	AI application	Expected managerial benefit
Strategic management	Forecasting, scenario analysis, market sensing	Better strategic decisions and earlier opportunity detection
Marketing and sales	Segmentation, personalization, pricing, lead scoring	Higher conversion, improved customer targeting
Finance	Cash-flow prediction, anomaly detection, budgeting support	Better financial control and risk reduction
Operations	Demand forecasting, scheduling, quality control, automation	Lower costs and higher process efficiency
HR management	Recruitment support, skills analysis, training design	Improved talent allocation and capability development
Customer service	Chatbots, ticket routing, sentiment analysis	Faster response and better customer experience
Innovation management	Idea screening, prototype support, knowledge mining	Faster experimentation and product development

Source: Author's synthesis.

3. AI as a management-improvement mechanism

The analysis suggests that AI improves management not because it replaces managers, but because it changes the quality and speed of managerial work. In entrepreneurial entities, managers often spend large amounts of time on repetitive analysis, fragmented reporting, and reactive decision-making. AI can reduce this burden and allow managers to focus more on interpretation, prioritization, and strategic coordination.

This leads to an important conclusion: the real value of AI lies in augmented management, not purely automated management. AI can generate recommendations, predictions, and classifications, but entrepreneurial performance

still depends on human judgment, contextual understanding, and leadership. The World Bank and UNCTAD both reinforce this broader point by showing that AI's benefits depend on stronger institutional and productive foundations rather than on tool access alone.

4. Key barriers and risks

Despite its promise, AI adoption in entrepreneurial entities faces important barriers.

The first barrier is data quality and integration. AI systems depend on usable data. If business data are incomplete, inconsistent, or fragmented across systems, AI outputs will be weak or misleading.

The second barrier is capability shortage. Many entrepreneurial entities lack staff with sufficient digital and analytical skills to implement and supervise AI tools effectively. This is one reason why adoption tends to be higher among larger firms.

The third barrier is cost and scalability. Although some AI tools have become more accessible, many firms still face financial and technical challenges when trying to scale AI from pilot use to organization-wide deployment.

The fourth barrier is governance and ethics. AI can introduce risks related to privacy, bias, explainability, security, and excessive reliance on automated outputs. These risks are especially serious in areas such as recruitment, finance, pricing, and customer treatment.

The fifth barrier is strategic mismatch. Some firms adopt AI because it is fashionable, not because it solves a defined managerial problem. In such cases, adoption creates noise rather than value.

Table 2.

Barriers to AI-based management improvement and recommended responses

Barrier	How it appears	Recommended response
Poor data quality	Inaccurate predictions, weak recommendations	Build clean data pipelines and governance rules

Skill shortages	Inability to deploy or supervise AI tools	Train staff and combine domain experts with digital specialists
Cost constraints	Pilot projects without scaling	Prioritize high-value use cases and phased implementation
Ethical and legal risks	Bias, privacy issues, opaque outputs	Introduce AI governance, audit trails, and human oversight
Strategic mismatch	Tools adopted without business need	Link AI projects to defined KPIs and strategic goals

Source: Author's synthesis based on the literature.

5. An integrated framework for AI-enabled management improvement

Based on the literature, AI can improve management in entrepreneurial entities when five conditions are met.

First, strategic alignment. AI initiatives must be tied to concrete management objectives such as forecasting accuracy, sales growth, service speed, or cost optimization.

Second, data infrastructure. Firms need accessible, reliable, and integrated data systems. Without this, AI tools remain disconnected from core management processes.

Third, organizational capability. Managers and employees need digital literacy, analytical skills, and the ability to work with AI-assisted outputs.

Fourth, process integration. AI should be embedded into actual workflows – planning, customer management, finance, and operations – rather than used as a stand-alone experiment.

Fifth, responsible governance. Firms must define rules for privacy, transparency, accountability, and human review in order to use AI sustainably.

Table 3.

Framework for using AI to improve management in entrepreneurial entities

Pillar	Managerial content	Practical tools	Expected result

Strategic alignment	Define AI priorities according to business needs	AI roadmap, use-case portfolio, target KPIs	Higher business relevance and ROI
Data infrastructure	Build reliable digital backbone	CRM, ERP, cloud storage, dashboards, data standards	Better inputs for AI-supported decisions
Organizational capability	Develop leadership and staff readiness	Training, AI champions, cross-functional teams	Stronger adoption and execution quality
Process integration	Embed AI into core managerial routines	Forecasting engines, workflow automation, analytics tools	Improved efficiency and decision speed
Responsible governance	Control risks and ensure trust	AI policy, human oversight, audits, ethics rules	Safer and more sustainable use of AI

Source: Author's development based on the reviewed literature.

6. Suggested KPI system

To evaluate AI as a management tool, entrepreneurial entities should use a mixed KPI system that includes both efficiency and strategic indicators.

– Possible indicators include:
– forecasting accuracy improvement,
– reduction in processing time,
– percentage of decisions supported by AI analytics,
– customer response-time reduction,
– increase in conversion rates,
– cash-flow variance reduction,
– productivity per employee,
– share of AI pilots scaled into routine operations.

The value of these indicators lies in linking AI adoption to measurable management outcomes rather than to technological symbolism alone.

Conclusion

Artificial intelligence has become one of the most important tools for management improvement in entrepreneurial entities under digital transformation. Its significance lies not only in automation, but also in its capacity to improve decision quality, accelerate learning, optimize processes, and support innovation.

For entrepreneurial entities that must compete under uncertainty and resource constraints, these benefits are strategically important.

At the same time, the article has shown that AI does not improve management automatically. Its effectiveness depends on strategic alignment, data quality, organizational capability, workflow integration, and responsible governance. Entrepreneurial entities that ignore these conditions may adopt AI tools without generating meaningful value.

The central conclusion of this study is that AI should be treated as an instrument of augmented managerial capability. It is most effective when it enhances human judgment, strengthens organizational responsiveness, and supports broader digital transformation goals. Future research can deepen this topic through sector-specific case studies, survey-based analysis of AI readiness, econometric testing of AI-performance relationships, and comparative studies of SMEs and larger firms.

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