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INTEGRATING ARTIFICIAL INTELLIGENCE INTO ENTREPRENEURIAL STRATEGIES: OPPORTUNITIES AND CHALLENGES

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ABSTRACT: The rapid advancement of Artificial Intelligence (AI) has created both unprecedented opportunities and pressing challenges for entrepreneurs, making its integration into business strategy a topic of growing urgency and relevance. This study aims to investigate how AI is incorporated into entrepreneurial strategies, the opportunities it generates, and the challenges it imposes, with particular attention to small and medium-sized enterprises (SMEs) and startups. Employing a qualitative library research design, the study draws on peer-reviewed journals, academic books, and industry reports published in the last decade. Using content analysis, the literature was categorized into two main themes opportunities and challenges and synthesized into a conceptual framework. The findings reveal that AI fosters innovation, efficiency, and market expansion through personalization, predictive analytics, and scalable business models, but entrepreneurs face significant barriers, including high implementation costs, skills shortages, regulatory uncertainty, and ethical dilemmas. The study contributes theoretically by integrating Dynamic Capabilities, Entrepreneurial Orientation, and technology acceptance models (TAM/UTAUT) to explain AI adoption in entrepreneurship. Practically, it offers guidance for entrepreneurs to maximize AI-driven opportunities while mitigating risks. The study acknowledges limitations inherent in library research and recommends empirical studies, such as surveys or case analyses, to validate and extend the proposed framework.
Keywords: Artificial Intelligence, Entrepreneurship, Entrepreneurial Strategy, Opportunities, Challenges

ABSTRAK: Kemajuan pesat Kecerdasan Buatan (AI) telah menciptakan peluang yang belum pernah terjadi sebelumnya dan tantangan mendesak bagi para pengusaha, menjadikan integrasinya ke dalam strategi bisnis sebagai topik yang semakin mendesak dan relevan. Studi ini bertujuan untuk menyelidiki bagaimana AI diintegrasikan ke dalam strategi kewirausahaan, peluang yang dihasilkannya, dan tantangan yang ditimbulkannya, dengan perhatian khusus pada usaha kecil dan menengah (UKM) dan perusahaan rintisan. Dengan menggunakan desain penelitian pustaka kualitatif, studi ini mengacu pada jurnal yang ditinjau sejawat, buku-buku akademis, dan laporan industri

yang diterbitkan dalam dekade terakhir. Dengan menggunakan analisis konten, literatur dikategorikan ke dalam dua tema utama: peluang dan tantangan, dan disintesis ke dalam kerangka konseptual. Temuan menunjukkan bahwa AI mendorong inovasi, efisiensi, dan ekspansi pasar melalui personalisasi, analitik prediktif, dan model bisnis yang dapat diskalakan, tetapi para pengusaha menghadapi hambatan signifikan, termasuk biaya implementasi yang tinggi, kekurangan keterampilan, ketidakpastian regulasi, dan dilema etika. Studi ini memberikan kontribusi teoritis dengan mengintegrasikan Kapabilitas Dinamis, Orientasi Kewirausahaan, dan model penerimaan teknologi (TAM/UTAUT) untuk menjelaskan adopsi AI dalam kewirausahaan. Secara praktis, penelitian ini menawarkan panduan bagi para pengusaha untuk memaksimalkan peluang yang didorong oleh AI sekaligus meminimalkan risiko. Studi ini mengakui keterbatasan yang melekat pada penelitian pustaka dan merekomendasikan studi empiris, seperti survei atau analisis kasus, untuk memvalidasi dan memperluas kerangka kerja yang diusulkan.

Kata kunci: Kecerdasan Buatan, Kewirausahaan, Strategi Kewirausahaan, Peluang, Tantangan

A. INTRODUCTION

The rapid advancement of Artificial Intelligence (AI) has generated profound implications for entrepreneurship. AI is no longer confined to operational functions but is increasingly regarded as a disruptive force capable of transforming business models, product innovation, and competitive strategies. Within this context, AI provides entrepreneurs with opportunities to enhance efficiency, expand market reach, and strengthen global competitiveness (Favour Oluwadamilare Usman et al., 2024).

Despite this potential, the adoption of AI in entrepreneurial practice remains complex and challenging. While many studies emphasize AI's transformative opportunities, obstacles such as limited resources, organizational resistance, and ethical concerns remain significant barriers. This is particularly true for small and medium-sized enterprises (SMEs) and startups, which often struggle with financial and technological constraints in implementing advanced digital tools (Etemad, 2024). As such, there is a pressing need to examine the dual dimensions of opportunities and challenges in AI integration within entrepreneurial strategies.

The literature increasingly highlights that AI should not be understood merely as a technological instrument but as a strategic enabler. Applications of AI in identifying new market opportunities, optimizing decision-making processes, and stimulating disruptive innovation are reshaping entrepreneurial strategy in fundamental ways (Alshurideh et

al., 2024). Accordingly, AI has become a cornerstone for entrepreneurs seeking to sustain long-term competitive advantage in rapidly evolving markets.

Nevertheless, most scholarly work on AI tends to focus on large firms equipped with advanced technological capacities, while research on SMEs and startups remains relatively underdeveloped. This imbalance is problematic, as SMEs and startups play a pivotal role in economic ecosystems but face unique vulnerabilities in adopting AI technologies (Güner Gültekin et al., 2025). Addressing this gap is essential to ensure that insights into AI adoption are relevant across diverse entrepreneurial contexts.

Another critical observation from existing literature is its bias toward opportunities rather than challenges. While research often highlights AI's ability to enhance innovation and efficiency, discussions of risks such as algorithmic bias, ethical dilemmas, and unintended social consequences are relatively scarce (Sophocleous, 2025). This lack of balance risks overestimating the benefits of AI while underestimating the complexity of its integration into entrepreneurial strategies.

Furthermore, the discourse on AI in entrepreneurship has often been technologically deterministic, overlooking the organizational and strategic adaptations necessary for effective implementation. Scholars argue that AI adoption involves not only technical integration but also transformations in creativity, decision-making, and organizational design (Townsend & Hunt, 2019). Therefore, entrepreneurship research must expand beyond the technical dimension to examine AI's strategic and managerial implications.

In response to these gaps, this study is guided by the following research questions: (1) How is AI integrated into entrepreneurial strategies according to the existing literature? (2) What opportunities does AI offer for entrepreneurship? and (3) What challenges do entrepreneurs face in adopting AI? These questions provide a framework for systematically examining the complex relationship between AI and entrepreneurial strategy.

The aim of this research is to conduct a literature-based investigation into the integration of AI into entrepreneurial strategies, with a particular focus on identifying emerging opportunities and challenges. By synthesizing prior studies, this paper seeks to contribute to the academic discourse on technology-driven entrepreneurship and provide practical insights for entrepreneurs navigating the digital era (Bickley et al., 2025).

B. METHODS

This study adopts a qualitative research design using a library research approach. Library research allows for the systematic collection, analysis, and synthesis of secondary data from scholarly sources such as peer-reviewed journals, academic books, and industry reports (Creswell & Creswell, 2017). This approach is particularly suitable for exploring Artificial Intelligence (AI) integration in entrepreneurial strategies, where empirical fieldwork remains limited and conceptual clarity is needed (Uriarte et al., 2025).

The data sources of this study consist of international and national peer-reviewed journals, academic books, and credible industry reports published within the last five to ten years. This timeframe ensures that the reviewed material reflects the latest developments in AI technologies and entrepreneurial practices. In line with established systematic review practices, only peer-reviewed publications and high-quality reports were included to guarantee the rigor and reliability of the analysis (Chen et al., 2024).

A content analysis technique was employed to analyze the collected literature (Chiarini, 2012). Content analysis enables researchers to identify recurring patterns, themes, and concepts across diverse studies. By applying this method, the research systematically categorized the literature into two overarching themes: *opportunities* and *challenges* of AI integration in entrepreneurship. This thematic categorization follows methodological guidance in entrepreneurship and AI literature reviews (Roundy & Asllani, 2024).

The analytical procedure began with categorization, where key findings were grouped into themes reflecting opportunities (e.g., personalization, predictive analytics, efficiency) and challenges (e.g., costs, skills gaps, regulation, ethics). Following categorization, a comparative analysis was conducted to identify similarities and differences in findings across studies. This step enhanced the robustness of the analysis by ensuring that conclusions were not drawn from isolated cases but from collective patterns in the literature (Siddiqui et al., 2024). Next, a synthesis process was undertaken to integrate the findings into a conceptual framework. The synthesis emphasized how opportunities and challenges coexist in the integration of AI into entrepreneurial strategies and highlighted potential trade-offs entrepreneurs face. Such synthesis is essential for moving beyond fragmented insights toward a comprehensive understanding of AI's role in entrepreneurship (Giuggioli & Pellegrini, 2022).

Finally, methodological rigor was ensured by triangulating findings across multiple sources and adopting transparent procedures in literature selection and analysis. The use of established guidelines for content and bibliometric analysis further strengthened the methodological validity of this research (Klarin, 2024). This structured methodological approach provides a robust foundation for exploring the opportunities and challenges of AI in entrepreneurial strategy.

C. RESULTS AND DISCUSSION

AI in Entrepreneurial Strategies

The literature consistently identifies AI as a transformative force reshaping entrepreneurial strategies by enhancing decision-making, innovation, and competitiveness. AI integration is not limited to automating operational tasks but extends to redefining business models and strategic orientations. For instance, studies emphasize how AI augments entrepreneurial creativity and capability in technology-based ventures, enabling startups to balance innovation with resource constraints (Majorana et al., 2025). This highlights a pattern where AI becomes embedded as both a functional tool and a strategic enabler in entrepreneurship.

Patterns of AI integration are also visible in entrepreneurial education and capacity-building contexts. Research shows that student entrepreneurs equipped with AI tools exhibit higher marketing performance and stronger dynamic capabilities. This suggests that entrepreneurial strategies increasingly rely on digital competence as a foundational skill, with AI serving as an accelerator of opportunity recognition and exploitation (Gong et al., 2025). Thus, education and training environments play a critical role in shaping how entrepreneurs integrate AI strategically.

Another recurring theme is AI's role in consumer behavior analysis and market adaptation. Entrepreneurs leverage AI to detect hidden patterns, predict demand fluctuations, and design personalized marketing strategies. This strategic use of AI allows firms to align products and services with evolving consumer expectations, thereby increasing market responsiveness and competitive advantage (Favour Oluwadamilare

Usman et al., 2024). This reflects a broader pattern where AI fosters customer-centric strategies across entrepreneurial ecosystems.

At the strategic management level, integration of AI is framed as a core axis of competitive strategy. Entrepreneurs adopt AI not simply as an add-on but as a foundational component of business strategy, enabling predictive insights, process optimization, and real-time decision support. Literature indicates that effective AI adoption requires alignment between business objectives and technological capabilities to ensure sustainable integration (Alet, 2023). This underscores a pattern where strategic alignment emerges as a precondition for successful AI-driven entrepreneurship.

AI integration also manifests in the transformation of entrepreneurial business models. Entrepreneurs are using AI to redesign ventures, create digital-first models, and pursue disruptive innovation in traditional industries. These transformations are not merely technological but involve shifts in organizational culture, resource allocation, and value creation processes (Fang, 2023). Thus, AI functions as a catalyst for both incremental improvements and radical strategic shifts in entrepreneurial practice.

Finally, integration patterns reveal a move toward hybrid approaches that combine AI with human creativity and judgment. Studies suggest that entrepreneurs who effectively synthesize AI-driven insights with human expertise achieve greater adaptability and resilience in uncertain markets (Truong et al., 2023). This hybridization represents an emerging pattern where AI is neither replacing human entrepreneurship nor functioning in isolation but becoming interwoven with entrepreneurial strategy as a complementary capability.

Opportunities from AI in Entrepreneurship

The literature highlights that AI offers entrepreneurs substantial opportunities to innovate and capture new business value. AI technologies facilitate advanced data analytics, enabling firms to identify unmet consumer needs, optimize operations, and create scalable digital solutions. Uriarte and Baier-Fuentes (2025) emphasize that AI-driven tools are not only reshaping existing businesses but also creating entirely new entrepreneurial ventures by expanding the boundaries of innovation (Uriarte et al., 2025). This indicates a pattern where AI acts as both a catalyst and platform for new opportunity creation.

One of the most widely recognized opportunities is AI's ability to enhance sustainable entrepreneurship. Bickley, Macintyre, and Torgler (2025) illustrate how AI, combined with big data, supports environmentally conscious business models by improving efficiency and minimizing waste (Bickley et al., 2025). This highlights a shift toward not only profit-driven but also purpose-driven entrepreneurship, where AI becomes an enabler of sustainable innovation and responsible market engagement.

AI also offers opportunities in entrepreneurship education, preparing future entrepreneurs with digital capabilities. Chen et al. (2024) demonstrate that embedding AI into entrepreneurship curricula enhances learners' ability to recognize entrepreneurial opportunities and fosters digital-oriented ventures (Chen et al., 2024). This signals that entrepreneurial strategies increasingly depend on competencies in AI literacy, positioning education as a key opportunity space for shaping entrepreneurial ecosystems.

From a business value perspective, Enholm, Papagiannidis, and Mikalef (2022) highlight AI's ability to create measurable value in terms of customer experience, productivity, and market expansion (Enholm et al., 2022). Entrepreneurs can deploy AI to personalize services, predict customer behavior, and scale ventures internationally. This opportunity reflects the transition of AI from a support function to a central strategic driver in entrepreneurship.

In addition, AI enables opportunities for systematic opportunity recognition. Giuggioli and Pellegrini (2023) argue that AI enhances entrepreneurs' ability to sense emerging trends, anticipate disruptions, and innovate within uncertain markets (Giuggioli & Pellegrini, 2022). Such findings underscore AI's role as an entrepreneurial enabler that strengthens foresight and reduces risk in decision-making processes.

Finally, AI offers pathways for integrating sustainability, efficiency, and innovation into business models. Toniolo et al. (2020) highlight that AI-driven tools foster sustainable business models by balancing profitability with environmental and social goals (Toniolo et al., 2020). Similarly, Obschonka and Audretsch (2020) argue that AI, combined with big data, marks a new era for entrepreneurship where digital intelligence fuels growth and inclusivity (Obschonka & Audretsch, 2020). This positions AI not only as a technological tool but as a transformative force shaping the entrepreneurial future.

Author(s), Year	Focus	Key Findings
(Uriarte et al., 2025)	AI technologies & entrepreneurship	AI creates new ventures and expands entrepreneurial innovation.
(Bickley et al., 2025)	AI & sustainable entrepreneurship	AI supports eco-friendly models and improves efficiency.
(Chen et al., 2024)	AI in entrepreneurship education	AI enhances learners' entrepreneurial opportunity recognition.
(Enholm et al., 2022)	AI and business value	AI boosts customer experience, productivity, and scalability.
(Giuggioli & Pellegrini, 2022)	AI as entrepreneurial enabler	AI enhances foresight, trend recognition, and market agility.
(Toniolo et al., 2020)	Sustainable business models & AI	AI enables balance of profitability with sustainability goals.
(Obschonka & Audretsch, 2020)	AI and big data in entrepreneurship	AI and big data mark a new era of inclusive entrepreneurship.

Challenges in AI Integration for Entrepreneurship

The first challenge identified across literature is the high cost of implementation. Small firms and startups often lack the capital to invest in sophisticated AI systems, data infrastructure, and ongoing maintenance. Research shows that while AI adoption can lower operational costs in the long run, the upfront financial burden is prohibitive for many entrepreneurs (Wright & Schultz, 2018). This imbalance widens the digital divide, giving established corporations disproportionate advantages in leveraging AI.

The second challenge concerns the shortage of digital and technical skills. Entrepreneurs frequently struggle to recruit or train employees with expertise in machine learning, data science, and algorithmic design. Koski and Husso (2018) emphasize that the demand for

advanced AI skills surpasses supply, creating barriers for SMEs to integrate AI into their business strategies (Weber et al., 2024). This skills gap restricts innovative potential and limits the scalability of AI-driven ventures.

Regulatory uncertainty is another critical barrier. Entrepreneurs operate in environments where AI regulations evolve unevenly across regions, leading to compliance challenges and legal risks. Scholars argue that existing governance frameworks are fragmented and lack clarity regarding accountability, intellectual property, and data privacy (Abuzaid & Alsbou, 2024). Such uncertainty discourages small ventures from investing in AI-driven strategies due to fears of future regulatory burdens.

Beyond costs and regulation, ethical dilemmas pose further challenges. Issues such as algorithmic bias, surveillance, and transparency undermine trust in AI applications. Du and Xie (2021) highlight paradoxes in consumer markets, where AI enables personalization but simultaneously risks exploitation of sensitive data (Du & Xie, 2021). For entrepreneurs, mismanaging these dilemmas can lead to reputational damage and loss of consumer confidence.

Moreover, legal frameworks around AI remain underdeveloped in many countries. Scholars point to a lack of standardized international regulations for AI applications in labor markets, healthcare, and finance (Andreeva et al., 2019). This regulatory vacuum forces entrepreneurs to navigate ambiguous legal contexts, increasing the risks associated with AI-based ventures.

Finally, challenges extend to the social and institutional dimensions of entrepreneurship. Revko and Galushka (2025) demonstrate that social entrepreneurs adopting AI face not only technical and legal issues but also difficulties aligning social objectives with profit motives (Revko & Galushka, 2025). These findings underscore that AI integration is not only a technological hurdle but also a strategic and societal balancing act for entrepreneurs.

Framework Proposal: Opportunities and Challenges

Synthesizing the literature reveals that AI creates a dual role in entrepreneurship: as both an opportunity generator and a source of challenges. Entrepreneurs adopt AI for personalization, predictive analytics, and efficiency, yet simultaneously encounter costs,

skills shortages, and regulatory risks. This paradox positions AI as a double-edged sword in entrepreneurial strategy (Cath, 2018).

The proposed conceptual framework situates AI at the center of entrepreneurial decision-making, connecting opportunities and challenges through dynamic feedback loops. Opportunities such as market expansion and sustainability drive adoption, while challenges such as ethics and regulation act as constraints. This balance influences whether AI integration leads to competitive advantage or failure (Xue & Pang, 2022).

Within this model, resources and capabilities moderate outcomes. Entrepreneurs with access to capital, skilled labor, and supportive ecosystems are more likely to harness opportunities, whereas under-resourced ventures struggle with the barriers. Thus, the framework highlights the role of institutional and ecosystem-level support in shaping AI's impact on entrepreneurship (Andreeva et al., 2019).

The framework also integrates ethical governance as a cross-cutting factor. By embedding responsible AI principles fairness, accountability, and transparency entrepreneurs can mitigate risks while sustaining consumer trust. Research stresses that ethical governance is not an optional add-on but a strategic imperative for long-term AI-enabled entrepreneurship (Du & Xie, 2021).

Additionally, the framework recognizes the temporal dimension of AI adoption. Initial adoption is challenge-heavy due to costs and uncertainties, but over time, as regulations mature and skills diffuse, opportunities become more accessible. This perspective encourages viewing AI adoption as an evolutionary process rather than a static outcome (O'Sullivan et al., 2019).

Ultimately, the framework proposes that AI integration in entrepreneurial strategies is best understood as a dialectical process, where opportunities and challenges continuously interact. Entrepreneurs who navigate this tension effectively are positioned to create sustainable competitive advantages, while those who fail to balance the dualities risk inefficiency or collapse (Abuzaid & Alsbou, 2024).

The findings of this study underscore the importance of Dynamic Capabilities (DC) in integrating AI into entrepreneurial strategies. DC theory emphasizes the ability of firms to sense opportunities, seize them, and reconfigure resources for sustained competitiveness. AI strengthens sensing through predictive analytics and big data while

enhancing seizing by enabling rapid decision-making. However, resource reconfiguration requires substantial investment in digital infrastructure and talent, often a barrier for SMEs (Ge & Zhao, 2022). This suggests that AI amplifies DC, but firms must address capability gaps to leverage it fully.

Entrepreneurial Orientation (EO) theory further contextualizes the findings. EO is characterized by innovativeness, proactiveness, and risk-taking, all of which align with AI adoption. Research demonstrates that organizations with strong EO are more likely to integrate AI effectively, using it as a tool for disruptive innovation and competitive differentiation (Rikhamba, 2024). Yet, the challenge lies in balancing risk-taking with responsible adoption, especially given regulatory and ethical uncertainties. This highlights EO as both an enabler and a risk factor in AI-driven entrepreneurship.

The Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT) provide additional insights into adoption behavior. Perceived usefulness and ease of use, central to TAM, strongly influence entrepreneurs' willingness to adopt AI. UTAUT extends this by incorporating social influence and facilitating conditions (Fetaji, 2023). Findings reveal that entrepreneurs adopt AI not only for operational benefits but also due to ecosystem pressures and support systems. Thus, adoption is shaped by both individual perceptions and broader institutional contexts.

Moreover, studies show that entrepreneurial self-efficacy mediates AI adoption by reinforcing confidence in technology-driven strategies. Ahmad et al. (2024) highlight that family-owned businesses adopt AI when leaders perceive themselves as digitally competent and strategically agile (Ahmad et al., 2024). This reinforces the interplay between UTAUT constructs and EO, demonstrating that self-belief and orientation toward innovation significantly influence technology integration.

Compared to prior literature, this study contributes by synthesizing opportunities and challenges within a single framework. While earlier studies emphasized either the benefits of AI adoption (Upadhyay et al., 2021) or the risks (Cath, 2018), this research integrates both dimensions. By applying DC, EO, and TAM/UTAUT lenses, the findings provide a more nuanced understanding of how entrepreneurs navigate the paradoxical nature of AI adoption. This dual perspective offers a theoretical advancement in the discourse on digital entrepreneurship.

The study also highlights the evolving role of entrepreneurial ecosystems in mediating AI adoption. Prior research often focused on firm-level factors, but this analysis underscores the importance of institutional support, regulatory clarity, and ecosystem collaboration. As Najarian and Hejazinia (2025) argue, acceptance models must incorporate ecosystem-level variables to reflect the realities of startup adoption environments (Najarian, 2025). This contribution extends TAM/UTAUT frameworks beyond individual perceptions to collective adoption contexts.

Practically, the findings suggest that entrepreneurs should adopt a strategic ambidexterity approach: exploiting AI for efficiency and customer engagement while exploring new markets through innovation. Aligning AI adoption with EO ensures that firms remain proactive and innovative, while DC capabilities help navigate uncertainty. However, entrepreneurs must also invest in ethical AI practices and governance structures to mitigate reputational risks (Duong et al., 2024). This balance between opportunity maximization and challenge mitigation defines long-term competitiveness.

Entrepreneurs should also prioritize building digital capabilities within their teams. Training and education programs can bridge skill gaps, while collaborations with universities and technology providers can provide access to AI resources otherwise unavailable to SMEs. As Rahimi and Oh (2024) argue, adapting TAM and UTAUT for entrepreneurial settings requires attention to contextual enablers, such as training, infrastructure, and regulatory incentives (Rahimi & Oh, 2024). Thus, practical adoption strategies must extend beyond individual entrepreneurs to include organizational and ecosystem-level interventions.

Finally, the implications of this study are twofold. For academia, it offers a multidimensional theoretical framework connecting DC, EO, and TAM/UTAUT to explain AI adoption in entrepreneurship. For practice, it provides actionable insights for entrepreneurs to align strategies with both opportunities and challenges. By framing AI as both an enabler and a disruptor, this study encourages entrepreneurs to adopt reflective, adaptable strategies that sustain competitiveness in an AI-driven economy (Kukanja, 2024).

D. CONCLUSION

This study set out to examine how Artificial Intelligence (AI) is integrated into entrepreneurial strategies, what opportunities it creates, and which challenges it poses. The findings show that AI plays a dual role: it enables entrepreneurs to personalize services, enhance predictive analytics, and scale into new markets, while simultaneously imposing challenges related to costs, skill shortages, regulatory uncertainty, and ethical concerns. In answering the research questions, the study highlights AI as both a catalyst for innovation and a disruptor requiring careful strategic adaptation.

Theoretically, this research contributes by linking Dynamic Capabilities, Entrepreneurial Orientation, and TAM/UTAUT frameworks to the adoption of AI in entrepreneurship. This multi-theoretical integration expands prior literature, which often emphasized either the technical or managerial aspects of AI adoption in isolation. By synthesizing opportunities and challenges within one conceptual framework, the study offers a more balanced and comprehensive understanding of AI's strategic role in entrepreneurship.

From a practical perspective, the study provides guidance for entrepreneurs on how to align AI adoption with innovation strategies while mitigating risks. Specifically, entrepreneurs should adopt ambidextrous strategies: exploiting AI for efficiency while exploring new value propositions. Building digital skills, fostering organizational learning, and embedding ethical governance are critical to ensuring sustainable AI adoption. These insights are particularly relevant for SMEs and startups operating under resource constraints.

Despite these contributions, the study has limitations. As a library-based research, it relies exclusively on secondary data drawn from existing literature. While this approach provides theoretical depth, it cannot capture real-time dynamics or contextual nuances of AI adoption across industries and geographies. The insights are therefore limited by the availability and scope of prior studies.

Future research should extend this work through empirical investigations, such as surveys of entrepreneurs or case studies of startups implementing AI solutions. Such approaches would validate and enrich the conceptual framework proposed here, providing more actionable insights into how entrepreneurs actually navigate opportunities and challenges in practice. Comparative studies across industries and regions could also illuminate contextual factors shaping AI adoption.

In conclusion, AI presents a paradox for entrepreneurs: it is both an unprecedented source of opportunity and a complex challenge requiring strategic agility, ethical foresight, and institutional support. Entrepreneurs who can balance these dualities stand to gain significant competitive advantage, while future research can help clarify the pathways to achieving such balance in diverse entrepreneurial contexts.

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