

The Role of Artificial Intelligence in Transforming Entrepreneurs' Strategic Decisions

Fatma CHIKHAOUI¹

¹ Assistant Professor, Business Department, Higher Institute of Management of Bizerte, University of Carthage, Tunisia

*Corresponding Author: fatma.chikhaoui@outlook.com

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Abstract

In a globalized economic environment characterized by rapid transformation, intensified competition, and growing uncertainty, entrepreneurs face increasingly complex decision-making challenges. These conditions demand strategic choices that are rapid, precise, and grounded in reliable information. Digital transformation has profoundly disrupted traditional management practices, introducing a wide range of innovative technological tools designed to enhance organizational efficiency, responsiveness, and competitiveness. Among these technologies, Artificial Intelligence (AI) has emerged as a major driver of transformation, reshaping the way entrepreneurs collect, analyze, and interpret strategic information, identify emerging opportunities, and anticipate potential risks. This conceptual article is based on an integrative review of literature in entrepreneurship, strategic management, and information systems. It highlights the essential role of AI in entrepreneurial decision-making by drawing on existing literature in entrepreneurship, strategic management, and information systems. It emphasizes AI's ability to support strategic choices through advanced data-processing techniques, predictive modeling, and automated analytics. The article adopts a structured conceptual approach, synthesizing different perspectives to clarify the mechanisms through which AI supports opportunity recognition, risk anticipation, and strategic decision-making under uncertainty. By enabling the extraction of relevant insights from large, diverse, and complex datasets, AI enhances forecasting accuracy, optimizes internal performance, and strengthens the agility of decision-making processes. The main contribution of this paper lies in proposing a conceptual framework and clarifying the theoretical mechanisms through which AI influences entrepreneurial decision-making, thereby offering a structured perspective on AI as a strategic enabler of more proactive, informed, and innovation-oriented decisions.

Keywords: artificial intelligence (AI), entrepreneurship, entrepreneurial decision-making, information systems, entrepreneurs

Introduction

In a world defined by accelerated technological progress, intensified global competition, and increasing economic complexity, Artificial Intelligence (AI) has emerged as an essential strategic lever for modern entrepreneurs. Once viewed as a purely theoretical concept, AI now plays a central role in the digital transformation of organizations by reshaping how businesses innovate, manage uncertainty, and formulate strategic decisions. Its integration not only enhances internal operational efficiency but also strengthens analytical capacity, responsiveness, and overall competitiveness. In this rapidly evolving context, characterized by the proliferation and complexity of data, AI provides entrepreneurs with powerful tools capable of extracting, structuring, and interpreting massive and heterogeneous datasets that were previously difficult to exploit. Through applications such as predictive analytics, pattern recognition, and advanced modeling, AI enables the anticipation of market trends, the identification of emerging consumer needs, and the support of faster, more precise, and

evidence-based strategic decisions. The recent rise of technologies such as machine learning, deep learning, and autonomous intelligent systems further reinforces entrepreneurial interest in AI, which has become increasingly accessible across industries and business models. Today, AI is no longer merely a competitive advantage; it constitutes a foundational component of entrepreneurial decision-making, particularly in environments marked by constant uncertainty and rapid market shifts.

Despite the growing body of research on artificial intelligence and entrepreneurship, existing studies remain largely fragmented, often focusing either on the technological aspects of AI or on its operational applications, while offering limited conceptual insight into its strategic role in entrepreneurial decision-making. Moreover, the mechanisms through which AI influences strategic choices, opportunity recognition, and risk anticipation among entrepreneurs are still insufficiently theorized. This conceptual article is based on an integrative review of literature in entrepreneurship, strategic management, and information systems. It highlights the essential role of AI in entrepreneurial decision-making by drawing on existing literature in entrepreneurship, strategic management, and information systems. It emphasizes AI's ability to support strategic choices through advanced data-processing techniques, predictive modeling, and automated analytics. The article adopts a structured conceptual approach, synthesizing different perspectives to clarify the mechanisms through which AI supports opportunity recognition, risk anticipation, and strategic decision-making under uncertainty. By enabling the extraction of relevant insights from large, diverse, and complex datasets, AI enhances forecasting accuracy, optimizes internal performance, and strengthens the agility of decision-making processes. The main contribution of this paper lies in proposing a conceptual framework and clarifying the theoretical mechanisms through which AI influences entrepreneurial decision-making, thereby offering a structured perspective on AI as a strategic enabler of more proactive, informed, and innovation-oriented decisions.

1. Historical overview of Artificial Intelligence

The history of artificial intelligence (AI) is characterized by a gradual evolution built upon major theoretical contributions and groundbreaking technological advances. Rather than a linear progression, this evolution reflects successive paradigms that have shaped how intelligence, decision-making, and rationality are conceptualized in machines. The origins of AI date back to the mid-20th century, when British mathematician Alan Turing laid the foundations for thinking about machine intelligence. In his seminal paper *Computing Machinery and Intelligence*, Turing introduced the fundamental question: Can machines think? To address this inquiry, he proposed the Turing Test, an empirical method designed to determine whether a machine can convincingly imitate human behavior in conversation. This early perspective framed intelligence primarily as observable behavior, a view that later influenced early decision-making models based on logical reasoning. The official birth of the concept of artificial intelligence occurred in 1956 during the Dartmouth Conference, organized by John McCarthy at the Massachusetts Institute of Technology (MIT). This historic event brought together several pioneers, including Marvin Minsky, Nathaniel Rochester, and Claude Shannon, who defined AI as the science and engineering of making intelligent machines. During this period, the first computer programs emerged, such as the Logic Theorist, which was capable of proving mathematical theorems. These early systems reflected a rational and rule-based vision of intelligence, closely aligned with normative models of decision-making. Although these early successes demonstrated the potential of AI, they remained limited by the technological capabilities of the time. The following decades, particularly the 1970s and 1980s, were marked by periods known as AI winters, during which funding declined sharply and research stagnated. Existing systems struggled to perform complex tasks, and initial expectations were tempered by technical limitations such as insufficient computational power and the lack of large-scale data. Despite these challenges, the 1980s saw the emergence of expert systems, a new AI approach that simulated human decision-making in specialized domains using rule-based knowledge structures. These systems provided concrete solutions in fields such as medicine and finance, although their rigidity and inability to learn limited their broader applicability. From a strategic perspective, expert systems supported decision-making but lacked adaptability, making them ill-suited for entrepreneurial environments characterized by uncertainty and change.

A major turning point occurred in the 2000s with the rapid increase in computing power and the rise of big data, which enabled the training of complex models using massive datasets. Machine learning, an AI branch focused on automatic learning from data—expanded rapidly, followed by even more transformative developments in deep learning. Based on artificial neural networks inspired by the human brain, deep learning allowed AI systems to recognize complex patterns, automate tasks, and surpass human performance in certain domains. These advances positioned deep learning at the core of the modern wave of artificial intelligence [7]. This shift marked a transition from rule-based decision support to adaptive and predictive decision systems, opening new perspectives for entrepreneurial strategic decision-making. Today, companies such as Google, Amazon, and OpenAI dominate the field by developing powerful models such as AlphaGo and ChatGPT. These technologies demonstrate how AI has evolved from a theoretical concept to an applied technology capable of transforming entire sectors, including entrepreneurship. This historical evolution suggests that AI has progressively moved closer to the cognitive and strategic dimensions of human decision-making, thereby justifying its growing relevance for entrepreneurial strategy.

2. Definitions of Artificial Intelligence

Artificial intelligence (AI) has been defined from multiple perspectives, reflecting the diversity of scientific approaches and technological paradigms. Alan Turing emphasized the ability of machines to imitate intelligent human behavior, introducing the Turing Test as a behavioral benchmark. While foundational, this definition emphasizes output over internal reasoning, highlighting the initial gap between AI capabilities and complex entrepreneurial decision-making. John McCarthy described AI as the science and engineering of making intelligent machines, capable of performing tasks requiring logical reasoning. Marvin Minsky highlighted the replication of human cognitive functions such as learning and adaptation. These early functional definitions reflect a rationalist view of intelligence, which is central to classical strategic decision models but insufficient for capturing the nuances of uncertainty, creativity, and entrepreneurial intuition.

Modern definitions describe AI as systems capable of perceiving environments, learning, and acting autonomously to achieve objectives [9]. Deep learning as a method to process vast datasets and improve over time [7]. These perspectives mark a conceptual evolution toward adaptive, predictive, and learning-based AI systems that can support dynamic decision-making in entrepreneurship. AI can be viewed as a general-purpose technology that transforms decision processes [2], as well as a tool augmenting human judgment [11]. This “human-AI complementarity” view is critical for entrepreneurs, suggesting that strategic decisions can be enhanced by AI without displacing the role of human intuition, especially in complex, uncertain environments. Artificial intelligence further demonstrates the ability to interpret data, learn continuously, and adapt actions, highlighting its strategic relevance for decision-making and innovation [12].

3. Technological foundations of Artificial Intelligence

Artificial intelligence (AI) relies on a robust and evolving technological framework, the result of decades of theoretical research and practical advancements. These technologies, often complementary, enable machines to process information, learn from data, and act autonomously to perform complex tasks. The development of AI is built upon several key pillars, including machine learning, deep learning, big data, robotic process automation (RPA), natural language processing (NLP), and computer vision. Machine learning lies at the core of modern AI systems. It is an approach in which machines learn from data without being explicitly programmed. Unlike traditional systems that depend on predefined instructions, machine learning uses statistical algorithms to identify patterns and generate predictive models. Machine learning is a process through which a computer program improves its performance in a given task based on past experiences [13]. For example, in the financial sector, machine learning systems detect potential fraud by analyzing unusual transaction behaviors. A major advancement within machine learning is deep learning, a subfield that relies on deep artificial neural networks designed to mimic the structure and functioning of the human brain. These networks consist of interconnected layers of neurons, with each layer extracting increasing levels of abstraction from the data. Deep learning is particularly powerful in domains such as image recognition, natural language understanding, and recommendation systems. Technologies like OpenAI’s ChatGPT use deep learning models to analyze, generate, and comprehend complex text based on vast datasets. Big data plays a central role in the functioning of modern AI systems. With the exponential growth of data generated by users, IoT sensors, and digital transactions, machines now have access to massive amounts of information to train and enhance their performance. Big data constitutes the raw material of AI, enabling the identification of subtle patterns and improving the accuracy of predictive algorithms [2]. These massive datasets are essential for applications such as climate forecasting, medical diagnostics, and supply chain optimization. In parallel, robotic process automation (RPA) enables organizations to automate repetitive, low-value tasks using intelligent software robots. This technology significantly boosts operational efficiency by reducing human error and freeing up resources for more strategic activities. For instance, in the banking sector, RPA is used to automate customer document verification and compliance processes. Natural language processing (NLP) is another fundamental component of AI, allowing machines to understand, interpret, and generate human language. NLP relies on techniques such as syntactic analysis, semantics, and probabilistic models to process complex textual data [14]. Common applications include chatbots, virtual assistants like Alexa or Siri, and automated translation tools. NLP also makes it possible to analyze customer sentiment through reviews and comments, a valuable tool for companies seeking to enhance their customer experience. Finally, computer vision enables machines to interpret and analyze images or videos. This technology relies on machine learning algorithms and image-processing techniques to detect objects, recognize faces, and analyze complex visual environments. In the medical field, for example, computer vision systems are used to diagnose diseases from X-rays or MRI scans with accuracy that sometimes surpasses that of human physicians [10]. In summary, the technological foundations of AI revolve around powerful tools that transform how machines learn, understand, and interact with the real world. These technologies combined with advancements in computing power and the availability of massive data pave the way for innovative applications that are redefining key sectors such as healthcare, industry, commerce, and services.

4. Impact of Artificial Intelligence on Entrepreneurs’ strategic decision-making

Artificial intelligence (AI) has become a major breakthrough in transforming strategic decision-making within organizations by providing innovative solutions capable of navigating complex and uncertain environments. This

transformation relies on three essential dimensions: data automation and analysis, predictive capabilities, and the optimization of strategic choices, while also raising significant technological, ethical, and human challenges. AI fundamentally revolutionizes the data analysis process by automating tasks traditionally performed manually and constrained by human cognitive limitations [4] [5]. Through advanced algorithms and machine learning techniques, AI systems can process massive amounts of unstructured data (big data), detect hidden patterns, and generate actionable strategic insights within significantly reduced timeframes. The integration of augmented analytics platforms such as IBM Watson or Power BI enables decision-makers to access automated and interactive decision reports, thereby reducing uncertainty and facilitating more informed decisions.

In parallel, AI's predictive capability represents one of its most significant contributions. Using sophisticated predictive analytics models, AI leverages historical data to anticipate future scenarios and propose optimal strategic actions. This predictive capacity applies to various domains such as financial management where it helps forecast investment risks and assess potential returns; human resource management where it anticipates recruitment needs and employee turnover risks; and marketing strategy where it predicts consumer buying behavior through trend analysis [2]. For example, Amazon's deployment of predictive models has enabled the optimization of inventory management by anticipating fluctuations in demand while significantly improving supply chain efficiency [3]. Thus, AI is emerging as an indispensable tool for anticipating challenges and capturing opportunities in a constantly evolving environment. A third major contribution of AI lies in its ability to support real-time decision-making. By combining data from multiple sources such as IoT sensors, social networks, or CRM systems, AI systems produce instantaneous, actionable recommendations tailored to dynamic contexts. In sectors requiring high reactivity such as industry, finance, or healthcare this capability becomes crucial. In industrial environments, AI enables predictive maintenance of machinery to anticipate failures and avoid costly downtime. In the financial sector, it ensures immediate fraud detection and anomaly identification through continuous monitoring algorithms. In the medical field, AI facilitates real-time diagnostics using radiological image analysis, achieving accuracy rates sometimes exceeding those of human experts [10]. Unlike traditional approaches based on static historical data, these applications demonstrate that AI supports dynamic and adaptive decision-making, maximizing the efficiency and responsiveness of strategic choices. Moreover, AI plays a key role in optimizing strategic decisions by reducing cognitive biases that often hinder human decision-making. Biases such as information overload, simplified heuristics, or risk underestimation can lead to irrational decisions [15]. With its ability to analyze massive datasets systematically and objectively, AI offers a more rational and reliable approach to decision-making. AI-enabled decision support systems (DSS) allow users to explore multiple strategic alternatives using multi-criteria analyses and comparative scenarios, thereby facilitating the selection of the most optimized solutions. This objectivity strengthens the credibility of decisions by eliminating the subjective influences that often affect human judgment. However, despite these notable advancements, the integration of AI into decision-making processes raises several major challenges. First, the high implementation cost of AI technologies including necessary infrastructures and staff training represents a significant barrier, particularly for small businesses with limited resources. Additionally, the lack of specialized expertise in data science and artificial intelligence constitutes a major obstacle to the adoption of these tools [8]. AI also raises ethical concerns related to algorithmic transparency and the protection of sensitive data [9]. Finally, excessive reliance on AI may lead to an erosion of human intuition, which remains essential in complex decisions involving qualitative and contextual elements. These challenges indicate that AI should be used as a support tool for human decision-makers, rather than a substitute, in order to maintain an optimal balance between technology and human judgment. In conclusion, artificial intelligence is transforming strategic decision-making by automating data analysis, enhancing predictive capabilities, and optimizing strategic choices through real-time adaptive recommendations. However, its adoption raises financial, ethical, and human challenges that require thoughtful consideration and a balanced approach. To fully leverage the potential of AI, organizations must invest in appropriate infrastructures, develop necessary competencies, and establish clear ethical frameworks to guide its use. By doing so, AI stands as a major lever enabling organizations to navigate complex environments while improving their competitiveness and strategic performance.

5. Challenges of Artificial Intelligence in Entrepreneurship

Despite its considerable advantages, the integration of artificial intelligence (AI) into startups and emerging enterprises faces several major challenges that limit its optimal adoption and transformative potential. The first and most significant challenge concerns the high cost of AI solutions. Initial expenditures include not only technological infrastructures such as servers, data storage, and specialized software, but also the costs associated with training teams to understand and effectively use these tools [2]. For many small businesses, these investments constitute a substantial barrier to entry, as they often lack the financial resources and organizational capacities required to deploy advanced AI systems. This is particularly true for technologies relying on deep learning or large-scale data processing, which demand significant computing power and highly specialized technical skills. Another major challenge lies in the scarcity of specialized skills in the field of artificial intelligence. A study conducted by the McKinsey Global Institute shows that the demand for experts in machine learning, big data, and data science far exceeds the available supply on the global labor market [8]. This talent shortage greatly slows the adoption of AI technologies, as companies struggle to recruit professionals capable of designing, implementing, and optimizing these solutions. Startups, in particular, face a dilemma: invest in internal training—which requires additional time and resources—or attempt to attract experts who are often recruited by large technology

companies offering competitive salaries. On the ethical front, the use of artificial intelligence raises major concerns regarding the protection of personal data and the transparency of algorithms. AI systems, especially those used in predictive applications, collect and analyze vast amounts of sensitive information, posing significant risks to user privacy. This highlights the need to establish robust regulatory frameworks to ensure the ethical and responsible use of AI technologies [9]. The European Union, for instance, introduced the General Data Protection Regulation (GDPR), which imposes strict obligations on the processing and security of personal data. Furthermore, the opacity of some AI algorithms, often referred to as the “black-box effect,” raises issues of trust and explainability. The development of interpretable AI models is essential so that the decisions made by these systems can be understood and validated by users [6]. In parallel, excessive automation poses a major societal challenge, with implications for the labor market and the structure of work. Although AI can enhance productivity by automating repetitive tasks, it also fuels concerns about the displacement of human jobs. Automation may replace low-skilled jobs, thereby worsening economic inequalities and intensifying social tensions [1]. However, these authors also note that AI has the potential to create new types of employment in emerging sectors, provided that workers receive adequate support to acquire new skills. Finally, the successful integration of AI depends on the compatibility of existing systems with these new technologies. Small businesses and startups are often hindered by outdated infrastructures that do not allow for the effective implementation of AI-based solutions. This issue is further exacerbated by the need for interoperability between platforms and technological tools an expensive and complex requirement for many organizations. Although artificial intelligence represents a major opportunity for entrepreneurship, it raises a series of financial, technical, ethical, and social challenges. Overcoming these obstacles requires investment in specialized training, the development of clear regulatory frameworks, and the promotion of an ethical and inclusive approach to AI adoption. AI should not be viewed solely as a performance tool but also as a lever for responsible and sustainable innovation in businesses.

6. Conclusion

Artificial intelligence (AI) has become an essential and transformative tool for modern entrepreneurs, fundamentally reshaping strategic decision-making. By analyzing large and heterogeneous datasets, AI enables entrepreneurs to identify opportunities, anticipate risks, and optimize strategic choices with enhanced precision. Advanced techniques such as predictive modeling, automated analytics, and real-time data processing improve forecasting accuracy, internal performance, and decision-making agility. The conceptual framework proposed in this paper synthesizes the historical evolution, definitions, technological foundations, impacts, and challenges of AI, providing a structured perspective on how AI functions as a strategic enabler in entrepreneurship. The evolution of AI, from early theoretical concepts and foundational research to contemporary technologies like machine learning, deep learning, and natural language processing, highlights its progression from abstract theory to practical, actionable solutions in entrepreneurship. Despite challenges such as high implementation costs, a shortage of specialized skills, and ethical concerns, AI acts as a strategic partner that complements human judgment, mitigates cognitive biases, and supports informed, real-time decision-making. By integrating AI into their decision-making processes within the proposed conceptual framework, entrepreneurs can enhance strategic performance, foster innovation, and sustain a competitive edge, providing both theoretical insights and practical guidance for navigating complex, dynamic, and uncertain business environments.

REFERENCES

- [1]. D. Acemoglu, and P. Restrepo, “Artificial Intelligence, Automation, and Work. *Journal of Economic Perspectives*”, 33(2), 193–210, 2018, <https://doi.org/10.1257/jep.33.2.193>.
- [2]. E. Brynjolfsson, and A. McAfee, “Machine, Platform, Crowd: Harnessing Our Digital Future”. W.W. Norton & Company, 2017.
- [3]. M. Chui, J. Manyika, and M. Miremadi, “What AI Can and Cannot Do (Yet) for Your Business”. McKinsey Quarterly, 2018.
- [4]. T. H. Davenport, and J.G. Harris, “Competing on Analytics: The New Science of Winning”, Harvard Business Review Press, 2007.
- [5]. T. H. Davenport, and R. Ronanki, “Artificial Intelligence for the Real World”, *Harvard Business Review*, 96(1), pp.108–116, 2018.
- [6]. F. Doshi-Velez, and B. Kim, “Towards a Rigorous Science of Interpretable Machine Learning”, arXiv preprint arXiv:1702.08608, 2018, <https://doi.org/10.48550/arXiv.1702.08608>.
- [7]. Y. LeCun, Y. Bengio, and G. Hinton, “Deep Learning. *Nature*”, 521(7553), pp.436–444, 2015, <https://doi.org/10.1038/nature14539>.
- [8]. McKinsey Global Institute, “The State of AI in 2022”. McKinsey & Company, 2022.
- [9]. S. Russell, and P. Norvig, “Artificial Intelligence: A Modern Approach (4th ed.)”, Pearson, 2016
- [10]. E. Topol, “Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again”, Basic Books, 2019.
- [11]. H.J. Wilson, and P.R Daugherty, “Human + Machine: Reimagining Work in the Age of AI”, Boston, MA: Harvard Business Review Press, 2018.
- [12]. M. Haenlein, and A. Kaplan, “A Brief History of Artificial Intelligence: On the Past, Present, and Future of

- Artificial Intelligence”, California Management Review, pp5-14, 2019,
<https://doi.org/10.1177/0008125619864925>
- [13]. T. Mitchell, “Machine Learning”, McGraw-Hill Higher Education, New York, 1997.
- [14]. D. Jurafsky, and J.H. Martin, “Speech and Language Processing”, 2019
https://web.stanford.edu/~jurafsky/slp3/old_oct19/17.pdf.
- [15]. D. Kahneman, “Thinking, Fast and Slow Penguin”, 2011, 496 pp., e 10.50, ISBN 978-0141033570.