

From the Digital Economy to the Algorithmic Economy: The Transformation of Economic and Institutional Decision-Making Models in the Age of Artificial Intelligence

Assia ZOUAD *

Ahmed Zabana University
of Relizane, Algeria

assia.zouad@univ-relizane.dz

Received: 21/07/2026

Accepted: 04/08/2026

Published: 01/09/2026

Abstract:

This study examines the transition from the digital economy to the algorithmic economy and its implications for transforming economic and institutional decision-making models in the age of artificial intelligence (AI). A descriptive-analytical approach was adopted, drawing on documentary analysis of relevant scientific literature, previous studies, international reports, and recent global indicators. The analysis was supported by publications issued by the OECD, UNCTAD, and the Stanford AI Index to explain the drivers, characteristics, and implications of this transition. The findings indicate that the algorithmic economy represents an advanced stage in the evolution of the digital economy, where data, algorithms, and AI have become strategic resources that enhance decision-making quality, improve operational efficiency, and strengthen institutional competitiveness. As a scientific contribution, the study proposes an analytical framework that explains the sequential transition from the digital economy to the algorithmic economy and identifies the institutional conditions required to support its effective implementation.

Key Words: Digital Economy; Algorithmic Economy; Artificial Intelligence; Algorithms; Decision-Making.

JEL Classification : O33, D81, D02, L86

* Corresponding author: Assia ZOUAD (*assia.zouad@univ-relizane.dz*)

Introduction

Over the past few decades, the global economy has undergone profound transformations driven by the rapid advancement of information and communication technologies (ICTs). These developments have fundamentally reshaped patterns of production, consumption, and exchange, while introducing significant changes to business environments and institutional management practices. In this evolving context, data, knowledge, and digital technologies have emerged as key economic assets, marking a gradual shift from physical-resource-based economic systems toward knowledge- and innovation-driven economies as primary engines of growth and competitiveness.

Against this backdrop, the digital economy has emerged as a new stage in economic development, characterized by the widespread adoption of digital technologies, online platforms, and big data across a broad range of economic activities. This transformation has enhanced market efficiency, improved institutional performance, and fostered more flexible business models. It has also created new opportunities to increase productivity, optimize resource allocation, and bring about fundamental changes in institutional management practices and economic decision-making.

However, the rapid progress of artificial intelligence (AI), machine learning, and big data analytics has gradually pushed economic transformation beyond the boundaries of the conventional digital economy. This evolution has given rise to what is increasingly referred to as the algorithmic economy, in which algorithms play a central role in analyzing data, forecasting future trends, and supporting economic and institutional decision-making with greater speed, accuracy, and adaptive learning capabilities. Consequently, economic value is no longer derived solely from generating and exchanging data, but increasingly from the ability of intelligent algorithms to convert data into actionable knowledge that enhances the quality and effectiveness of decisions.

The rise of algorithm-driven decision-making has had far-reaching implications across various economic sectors. Algorithms are now extensively employed in financial markets, e-commerce, supply chain management, risk assessment, intelligent marketing, and resource allocation. Their applications have also expanded within organizations to support planning, forecasting, and decision-making processes. As a result, decision-making models have progressively evolved from approaches primarily based on human expertise and conventional analysis toward hybrid models that integrate human judgment with the analytical capabilities of artificial intelligence. In some fields, this evolution has even led to increasing reliance on algorithm-assisted decision-making.

Although the literature on the digital economy and artificial intelligence has expanded considerably, most studies have focused either on the effects of digital transformation or on AI applications within specific economic domains. By contrast, relatively limited attention has been devoted to the algorithmic economy as a distinct and more advanced stage in the evolution of the digital economy, particularly with regard to its implications for economic and institutional decision-making. This gap is especially evident in the Arabic literature. Accordingly, the present study seeks to contribute to addressing this gap by providing an analytical perspective on the transition toward the algorithmic economy and examining its impact on contemporary decision-making models in the age of artificial intelligence.

The significance of this study stems from the growing relevance of the algorithmic economy as an emerging paradigm that raises important theoretical and practical questions concerning the future of economic and institutional decision-making. Accordingly, the study aims to analyze the transition from the digital economy to the algorithmic economy and examine its implications for reshaping decision-making models. To achieve this objective, the study adopts a descriptive-analytical approach supported by academic publications and relevant international reports. Relevant

literature was identified through Google Scholar using the keywords Digital Economy, Algorithmic Economy, Artificial Intelligence, Algorithms, and Decision-Making. The selection focused on studies published between 2020 and 2025 that addressed the subject of the research.

Accordingly, the study seeks to address the following main research question:

How has the transition from the digital economy to the algorithmic economy reshaped economic and institutional decision-making models in the era of artificial intelligence?

Based on this research question, the study tests the following hypotheses:

- The algorithmic economy represents an advanced stage in the evolution of the digital economy, driven by the growing reliance on data, artificial intelligence, and algorithms as key sources of economic value.
- The transition toward the algorithmic economy reshapes economic and institutional decision-making models by enhancing data analysis, forecasting capabilities, and decision support.
- The successful transition to the algorithmic economy depends on the existence of an appropriate institutional and legislative environment that promotes AI governance and ensures the responsible use of algorithms.

I. Previous Studies and Research Gap

The growing expansion of the digital economy and artificial intelligence has attracted increasing attention in the economic literature owing to their profound impact on business environments, institutional management, and decision-making processes. Existing studies have examined these developments from different perspectives, including the role of the digital economy in improving economic performance, the contribution of artificial intelligence to productive efficiency, and the application of algorithms in supporting economic and institutional decision-making. However, these issues have largely been examined in isolation, with limited attention devoted to the transition from the digital economy to the algorithmic economy as a distinct stage of economic evolution. Consequently, the literature still lacks an integrated analytical framework capable of explaining this transition and its implications for economic and institutional decision-making.

Table 1: « Analytical Review of Previous Studies »

Author/Stu dy	Objective	Methodology	Main Findings	Contribution to the Present Study
Al-Zatil (2026) The Role of Artificial Intelligence in Deepening Value Added and Building Competitive Advantage in the Digital Economy	To analyze the role of artificial intelligence in deepening value added and achieving competitive advantage within the digital economy.	Descriptive-analytical	The study found that AI technologies improve the efficiency of economic activities and strengthen institutional competitiveness through effective data utilization and enhanced decision quality.	Provides a theoretical basis for explaining the relationship between artificial intelligence and the digital economy as the foundation for the emergence of the algorithmic economy.
Shour (2026) Measuring the Impact of the Digital Economy and Artificial Intelligence Technologies on Improving Economic Performance Indicators in Iraq	To measure the impact of the digital economy and AI technologies on selected economic performance indicators in Iraq.	Descriptive-analytical based on economic indicators	The findings revealed a positive effect of digital economy development and AI technologies on improving some economic performance indicators, emphasizing the importance of investment in digital infrastructure.	Supports the theoretical analysis by linking digital transformation to the evolution of economic decision-making processes.
Qashi (2023) The Economics of Artificial Intelligence: Developments and Implications	To analyze the economic developments associated with artificial intelligence and their implications for economic activities and institutions.	Descriptive theoretical analysis	The study concluded that artificial intelligence has become a key driver of innovation, productivity, and market transformation, while creating new regulatory and ethical challenges.	Contributes to establishing the economic foundations of artificial intelligence as the primary driver of the algorithmic economy.
Luong, Kumar & Lang (2020) Algorithmic Decision-Making: Examining the Interplay of People, Technology, and Organizational Practices through an Economic Experiment	To examine the interaction between human expertise and algorithms in institutional decision-making.	Economic experiment	The study demonstrated that integrating human expertise with algorithmic analysis improves decision quality and supports organizational practices.	Provides an explanation of the transition from traditional decision-making to algorithm-supported decision-making.
Lobel (2021) Revenue Management and the Rise of the Algorithmic Economy	To analyze the role of algorithms in platform economies and revenue management.	Theoretical analysis	The study showed that algorithms have become essential for pricing, demand management, and resource allocation in digital markets.	Contributes to defining the concept of the algorithmic economy and identifying its main characteristics and mechanisms.



Chen, Hu & Li (2022) Algorithmic Decision-Making Safeguarded by Human Knowledge	To examine the relationship between algorithmic decision-making and human knowledge, and the limits of relying on intelligent systems.	Theoretical analysis	The study confirmed that algorithms are highly effective in processing data and improving decisions; however, complex decisions still require human judgment and managerial evaluation.	Supports the discussion of the limitations of algorithmic decision-making and highlights the importance of complementing artificial intelligence with human expertise.
---	--	----------------------	---	--

Source: Prepared by the author based on the studies listed in the references

1.Analysis of Previous Studies and Research Gap

The reviewed studies collectively demonstrate the growing importance of digital technologies and artificial intelligence in improving economic performance, enhancing organizational efficiency, and supporting decision-making processes. However, they have generally addressed the digital economy, artificial intelligence, and algorithmic decision-making as separate research areas, with limited attention to the evolutionary relationship between them. Consequently, the transition from the digital economy to the algorithmic economy has not been sufficiently examined as a distinct stage of economic development, nor have its implications for transforming economic and institutional decision-making models been comprehensively analyzed. This reveals a clear research gap in the absence of an integrated analytical framework capable of explaining this transition and its impact on contemporary decision-making. Accordingly, the present study seeks to fill this gap by proposing an analytical framework that explains the transition from the digital economy to the algorithmic economy and examines its implications for economic and institutional decision-making in the age of artificial intelligence.

II. From the Digital Economy to the Algorithmic Economy: Conceptual Framework and the Transformation of Decision-Making Logic

Over the past few decades, the global economy has undergone profound transformations driven by the rapid advancement of information and communication technologies (ICT), leading to significant changes in production systems, exchange mechanisms, and institutional management. These developments have fundamentally altered the nature of economic activity, with data and digital technologies emerging as a fundamental resource for value creation and efficiency enhancement. As this transformation has accelerated, attention has gradually shifted from the digitalization of economic activities to the application of algorithms and artificial intelligence in data analysis and decision-making, giving rise to the concept of the algorithmic economy as a more advanced stage in the evolution of the digital economy. Against this background, this section first examines the concepts of the

digital economy and the algorithmic economy before discussing the transformation of economic and institutional decision-making models.

1. The Digital Economy: Concept and Characteristics

The concept of the digital economy emerged alongside the widespread adoption of information and communication technologies and has come to describe economic activities that rely on digital technologies in production, marketing, exchange, and service delivery. This economic model is based on the use of data, digital networks, and modern technological applications to improve operational efficiency and optimize resource utilization, making it one of the defining features of contemporary economic transformation (Al-Rakhawi, 2023, pp. 22-23)

The digital economy extends beyond the mere use of electronic technologies to conduct transactions; it involves the reorganization of economic activities within an environment characterized by continuous connectivity and real-time data exchange. This transformation has facilitated the emergence of new business models, including e-commerce, digital platforms, and cloud-based services, which have expanded market access, reduced transaction costs, and increased responsiveness to consumer needs (Al-Rakhawi, 2023, pp. 24-26).

Among its most prominent characteristics are the recognition of data as an economic resource, the flexibility of business operations, the ability to transcend geographical boundaries, and the promotion of innovation and productivity. Furthermore, the digital economy has strengthened the competitiveness of organizations by enabling them to use digital technologies to improve products, services, and managerial decision-making processes (Al-Rakhawi, 2023, pp. 26-27)

The Organisation for Economic Co-operation and Development (OECD) considers the digital economy one of the principal drivers of economic growth, owing to its contribution to increasing productivity, fostering innovation, improving the business environment, and supporting the digital transformation of both enterprises and public administrations (OECD, 2024).

Despite its considerable contribution to economic development, recent advances in artificial intelligence and machine learning have demonstrated that the digitalization of economic activities alone is no longer sufficient to achieve higher levels of efficiency. Algorithms are now capable of analyzing data and generating decision alternatives with greater speed and accuracy, thereby paving the way for a new stage known as the algorithmic economy.

2. The Algorithmic Economy: Concept and Characteristics

2.1. The Concept of the Algorithmic Economy

The concept of the algorithmic economy has emerged as a result of the rapid advancement of artificial intelligence technologies and big data analytics. In this context, algorithms have evolved beyond performing computational tasks to analyzing data, identifying patterns, forecasting outcomes, and supporting decision-making processes. The algorithmic economy represents a new stage in the evolution of the digital economy, in which organizations and markets increasingly rely on algorithms to manage economic activities and improve operational efficiency, enabling faster and more accurate data-driven decision-making (Lobel, 2021).

According to Luong et al. (2020), the algorithmic economy is not intended to replace the human element but rather to establish a complementary relationship between human expertise and intelligent systems. In this model, algorithms are responsible for processing and analyzing data, while humans retain supervisory responsibilities, evaluate outcomes, and make final decisions in situations that require professional judgment and experience (Luong., Kumar, & Lang, 2020).

Recent economic literature further suggests that the transition toward an economy driven by artificial intelligence extends beyond the adoption of advanced digital technologies. It also involves restructuring production systems, distribution mechanisms, and decision-making processes in ways that enhance economic efficiency, improve predictive capabilities, and optimize resource allocation. From this perspective, artificial intelligence constitutes the technological foundation upon which the algorithmic economy is built, enabling the development of more adaptive and responsive economic models (Qashi, 2023).

2.2. Characteristics of the Algorithmic Economy

The algorithmic economy is distinguished by several characteristics that differentiate it from the digital economy. Among the most important are its reliance on big data, its capacity for continuous learning through artificial intelligence technologies, its ability to process information rapidly, and its effectiveness in improving the accuracy of economic forecasting. It also enables the evaluation of a large number of alternatives within a very short time, thereby enhancing resource allocation efficiency and reducing errors associated with traditional estimation methods (Chen, Hu, & Li, 2022).

Another defining feature of the algorithmic economy is the broad range of its applications. Algorithms are now widely employed in financial markets, e-commerce, supply chain management, digital marketing, and risk management, while also supporting planning and decision-making processes within organizations. Consequently, intelligent systems have become increasingly integrated into tasks that previously depended primarily on direct human intervention (Stanford AI Index Report, 2025).

Moreover, artificial intelligence applications contribute to deepening added value and strengthening the competitive advantage of organizations by improving data utilization, enhancing resource allocation efficiency, and supporting strategic decision-making within the digital economy. These capabilities enable organizations to adapt more effectively to changing economic conditions while achieving higher levels of operational performance (Al-Zatil, 2026).

3. The Transition from the Digital Economy to the Algorithmic Economy and Its Impact on Economic and Institutional Decision-Making

3.1. The Transition from the Digital Economy to the Algorithmic Economy

The digital economy is no longer regarded as the final stage of technological transformation; rather, it has become the foundation upon which the algorithmic economy has emerged. While the digital economy primarily focused on the digitalization of economic activities and their integration with modern technologies, the algorithmic economy has moved beyond this stage by relying on algorithms to

analyze data, forecast future trends, and support real-time decision-making. This transformation reflects a shift in the role of technology from merely facilitating economic operations to actively shaping economic activities and resource management (Lobel, 2021).

This transition has been driven by the widespread adoption of artificial intelligence and machine learning technologies, together with the continuous growth in the volume of data generated by organizations and individuals. As a result, intelligent systems capable of learning from data and continuously improving their performance have been developed, leading to greater reliance on algorithms to address economic challenges that require rapid responses and highly accurate predictions (Chen, Hu, & Li, 2022)

3.2. The Impact of the Algorithmic Economy on Economic and Institutional Decision-Making

The growing diffusion of the algorithmic economy has fundamentally transformed decision-making processes within organizations and markets. Whereas decisions were previously based primarily on human expertise and conventional analytical methods, they are now increasingly supported by algorithmic models capable of processing a large number of variables within a short period. This has contributed to improving decision quality while reducing the uncertainty associated with economic and institutional decision-making (Luong., Kumar, & Lang, 2020).

The algorithmic economy has also enhanced planning processes, risk management, and resource allocation by providing real-time information and analytical insights that enable decision-makers to identify the most efficient alternatives. Despite these advances, recent literature emphasizes that effective decision-making should not rely exclusively on algorithms. Instead, it requires a complementary relationship between artificial intelligence and human expertise to ensure efficiency while taking ethical and regulatory considerations into account (Chen, Hu, & Li, 2022).

III. The Transition toward the Algorithmic Economy and Its Implications for Economic and Institutional Decision-Making Models

The rapid advancement of artificial intelligence technologies has brought about a qualitative transformation in the digital economy. Digitalization is no longer confined to automating processes and facilitating information exchange; rather, data and algorithms have become the core resources for analyzing information and supporting decision-making across organizations and markets. This transformation has given rise to what is commonly referred to as the algorithmic economy, which relies on artificial intelligence and machine learning technologies to manage resources, forecast future trends, and improve economic efficiency. To illustrate this transformation, the present study draws upon a set of recent international indicators that reflect the growth of investment in artificial intelligence and its expanding adoption by organizations, both of which represent key indicators of the global transition toward a more algorithm-driven economy.

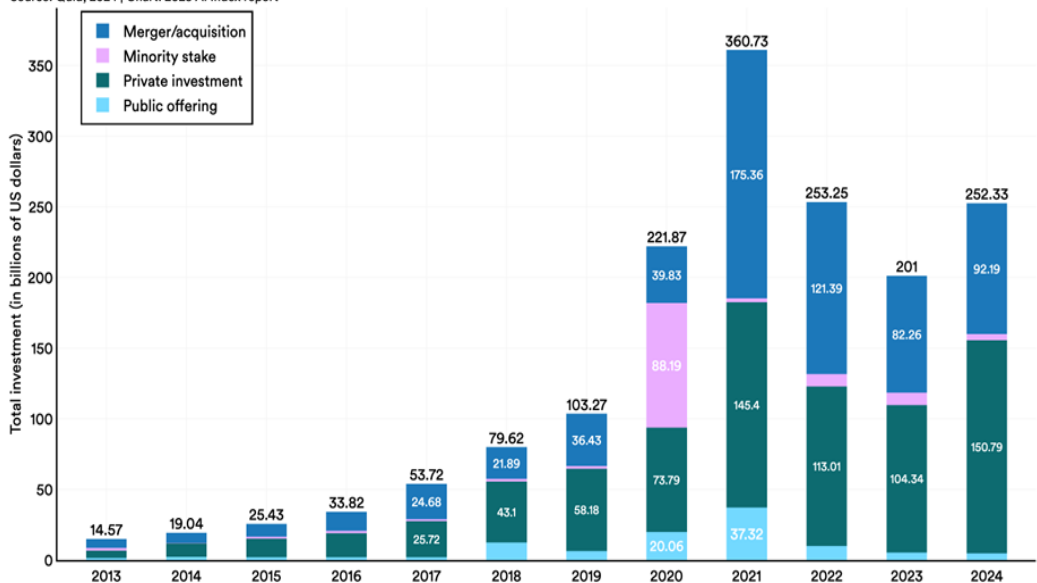
1.The Rise of Global Investment in Artificial Intelligence: An Indicator of the Transition toward the Algorithmic Economy

In recent years, the global economy has witnessed a remarkable increase in investment directed toward artificial intelligence technologies, reflecting the growing recognition among governments and businesses of their potential to foster innovation, enhance productivity, and strengthen competitiveness. This trend has accelerated the development of algorithms and expanded their application across a wide range of economic activities, making investment in artificial intelligence one of the most significant indicators of the transition from the digital economy to the algorithmic economy. To illustrate this evolution, Figure 1 presents the development of global private investment in artificial intelligence by investment activity during the period 2013–2024.

Fig. 1: « Global Private Investment in Artificial Intelligence, 2013–2024»

Global corporate investment in AI by investment activity, 2013–24

Source: Quid, 2024 | Chart: 2025 AI Index report



Source: Stanford Institute for Human-Centered Artificial Intelligence (HAI). (2025). AI Index Report 2025, Economy Chapter, Figure: Global Private AI Investment. <https://hai.stanford.edu/ai-index>

Figure 1 illustrates the upward trend in global investment in artificial intelligence between 2013 and 2024. Total investment increased from USD 14.57 billion in 2013 to USD 252.33 billion in 2024, despite relative slowdowns in some years. The figure also shows that private investment accounted for the largest share of total AI investment, alongside continued activity in mergers and acquisitions, minority investments, and public offerings, reflecting the diversification of funding sources and the growing interest of investors in artificial intelligence applications (Stanford AI Index Report, 2025)

The sustained growth in artificial intelligence investment reflects its increasing role as a strategic economic asset that extends beyond technological innovation. By

expanding investment in advanced algorithms and data-processing capabilities, organizations strengthen their ability to analyze complex information, evaluate alternatives, and improve the quality of economic and institutional decision-making. This evolution is consistent with Simon's theory of bounded rationality, which argues that decision quality improves as organizations enhance their capacity to acquire, process, and evaluate relevant information (Simon, 1977).

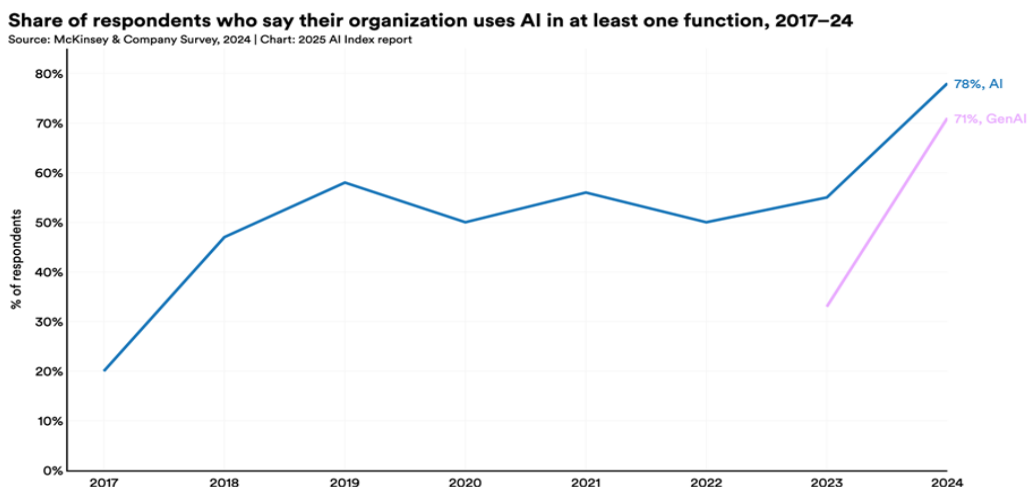
In this context, artificial intelligence enables organizations to integrate advanced algorithms into decision-making processes, accelerating the transition toward the algorithmic economy (Shrestha, Ben-Menahem, & von Krogh, 2019)

The implications of rising investment in artificial intelligence extend beyond increased spending on technological development. They are also reflected in the growing adoption of AI applications by organizations, as illustrated in Figure 2.

2. The Expansion of Artificial Intelligence Adoption in Organizations: A Practical Manifestation of the Transition toward the Algorithmic Economy

The impact of artificial intelligence is no longer confined to the growing volume of investment directed toward the development of digital technologies. It has expanded to encompass a wide range of economic activities within organizations. Advances in machine learning, big data analytics, and cloud computing have enabled the broader adoption of artificial intelligence in operations management, demand forecasting, market analysis, resource allocation, and the support of managerial and strategic decision-making. This development reflects a transition from using digital technologies merely to execute operations to relying on algorithms to analyze data, generate alternatives, and support decision-making, which represents one of the most significant manifestations of the algorithmic economy. To illustrate this transformation, Figure 2 presents the evolution of artificial intelligence adoption in organizations alongside private AI investment in 2024.

Fig. 2: « Evolution of Artificial Intelligence Adoption in Organizations and Private AI Investment in 2024 »



Source: Stanford Institute for Human-Centered Artificial Intelligence (HAI). AI Index Report 2025, Economy Chapter.

The data presented in Figure 2 indicate that artificial intelligence has become an integral component of organizational strategies. The proportion of organizations adopting AI applications increased from 55% in 2023 to 78% in 2024, reflecting the accelerated integration of these technologies across a wide range of economic activities. Private investment in artificial intelligence also recorded substantial growth, reaching USD 109.1 billion in the United States, compared with USD 9.3 billion in China and USD 4.5 billion in the United Kingdom. Meanwhile, generative artificial intelligence attracted USD 33.9 billion in private investment, representing an 18.7% increase compared with 2023 (Stanford AI Index Report, 2025).

The rapid expansion of artificial intelligence adoption within organizations reflects a fundamental transformation in organizational decision-making, extending beyond the simple diffusion of digital technologies toward the integration of intelligent algorithms into core managerial and economic processes. As the integration of intelligent algorithms into organizational activities increases, decision-making becomes progressively supported by advanced data analysis and algorithmic evaluation. However, the effectiveness of these systems depends on combining algorithmic capabilities with human knowledge and managerial judgment, particularly in complex decision contexts. This interaction enhances the quality and reliability of organizational decisions and reinforces the transition toward the algorithmic economy (Chen, Hu, & Li, 2022).

Moreover, these indicators reflect not only the growing adoption of artificial intelligence within organizations but also a fundamental shift in the logic of managing economic activities. Algorithms now play an increasingly important role in data analysis, the evaluation of alternatives, and decision support. Consequently, economic value is no longer determined solely by the availability of data, but by organizations' ability to utilize that data and transform it into more accurate and efficient decisions, which represents the very essence of the algorithmic economy.

The preceding analysis lays the groundwork for examining the transition from the digital economy to the algorithmic economy. Accordingly, the following sections seek to answer the following question: How do recent international indicators explain the transition toward the algorithmic economy, and what are the implications of this transformation for contemporary economic and institutional decision-making?

3. The Transition toward the Algorithmic Economy: An Analytical Interpretation Based on International Indicators

The international indicators presented above suggest that the transition toward the algorithmic economy is no longer merely a technological trend but has become an economic reality that is reshaping the mechanisms of value creation and the management of economic activities. The continuous growth in investment directed toward artificial intelligence, together with its expanding adoption across organizations, reflects the transition of the global economy to a stage in which data and algorithms have become strategic resources that are no less important than capital and labor.

This transformation has extended beyond the development of digital technologies to fundamentally alter the logic of decision-making within organizations and markets. Whereas decision-making previously relied primarily on conventional data analysis and human expertise, algorithms are now capable of processing massive volumes of data in real time, identifying patterns and relationships, and generating forecasts that support faster and more accurate decision-making. As a result, organizations have improved resource management, demand forecasting, risk mitigation, and productivity across a wide range of economic sectors.

These developments indicate that competitive advantage in the contemporary economy is no longer determined solely by the possession of digital technologies but increasingly depends on organizations' ability to leverage data and algorithms to build more efficient and adaptable business models capable of responding to economic changes. From this perspective, the algorithmic economy represents an advanced stage in the digital transformation process, where data are converted into economic knowledge that supports innovation and decision-making.

To highlight the fundamental differences between the digital economy and the algorithmic economy, Table (2) provides an analytical comparison illustrating the nature and key dimensions of this transformation.

Table 2: « Analytical Comparison between the Digital Economy and the Algorithmic Economy »

Dimension	Digital Economy	Algorithmic Economy
Foundation	Digitalization and the use of information and communication technologies	Data, artificial intelligence, and algorithms
Source of value creation	Digitalization of processes and services	Data analysis, forecasting, and decision-making
Role of data	An economic resource	A strategic asset for generating knowledge and supporting decisions
Nature of decision-making	Human decision-making supported by digital tools	Algorithm-assisted decision-making under human supervision
Decision-making indicator	Decisions are primarily based on descriptive data, human analysis, and digital information systems.	Decisions are supported by predictive analytics, algorithmic models, and AI-driven recommendations under human supervision.
Competitive advantage	Digital transformation and improved efficiency	Algorithmic intelligence, rapid responsiveness, and predictive capability
Major challenges	Digital divide and cybersecurity	Transparency, algorithmic bias, data protection, and governance

Source: Prepared by the author based on OECD (2024), UNCTAD (2024), Stanford HAI (2025), and the scientific references cited in this study.

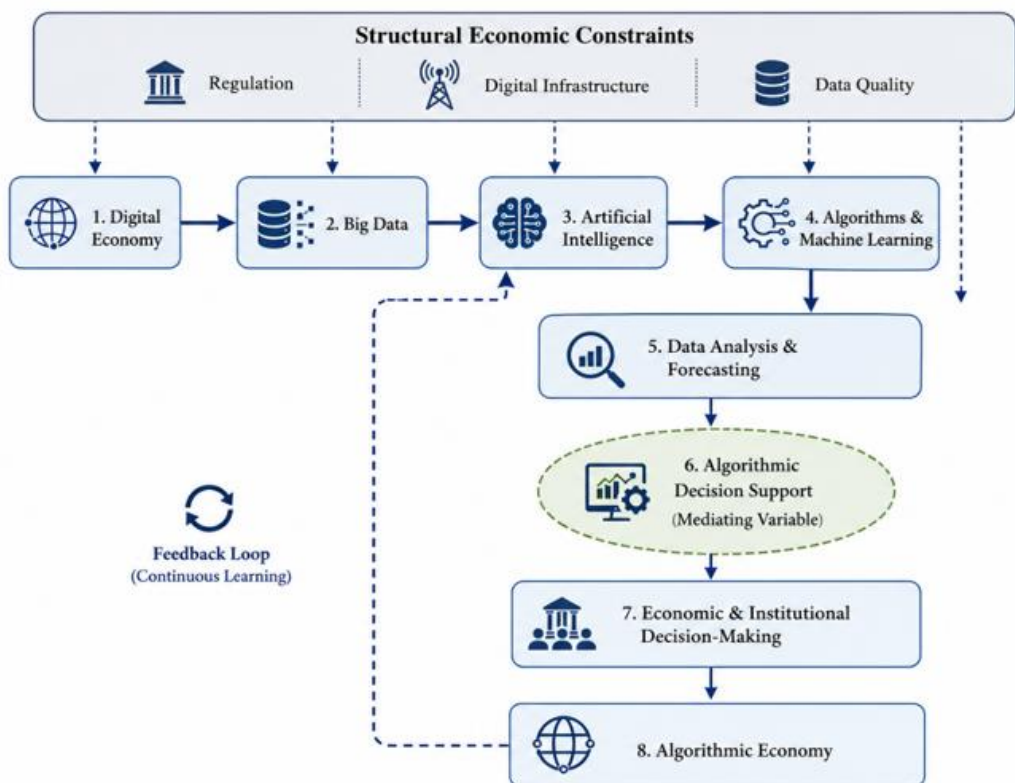
The comparison presented in Table 2 demonstrates that the algorithmic economy represents a more advanced stage in the evolution of the digital economy, shifting the focus from the digitalization of economic activities to the utilization of data and

algorithms in supporting decision-making. The comparison also highlights differences in the decision-making indicators of the two models. While the digital economy relies primarily on descriptive data, human analysis, and digital information systems, the algorithmic economy increasingly depends on predictive analytics, algorithmic models, and AI-driven recommendations under human supervision. The comparison also shows that organizations' competitive advantage no longer depends solely on the adoption of digital technologies but increasingly on their ability to analyze data and exploit algorithms to enhance efficiency and improve the quality of economic decision-making.

4. Proposed Analytical Framework for the Transition from the Digital Economy to the Algorithmic Economy

In light of the theoretical discussion and the international indicators presented above, it becomes evident that the transition from the digital economy to the algorithmic economy is not driven by a single factor, but rather results from the interaction of technological, organizational, and economic variables. To illustrate these relationships in an integrated manner, this study proposes the following analytical framework, which outlines the main stages of this transformation and explains how institutions move from digitalization toward the use of data, algorithms, and artificial intelligence to support economic and institutional decision-making.

Fig. 3: Proposed Analytical Framework for the Transition from the Digital Economy to the Algorithmic Economy»



Source: Developed by the author based on recent economic literature and reports from the OECD, Stanford HAI, and UNCTAD.

Figure (3) presents an analytical framework explaining the transition from the digital economy to the algorithmic economy. The framework is developed on the basis of the relevant literature and international reports, particularly those published by the OECD (2024), Stanford HAI (2025), and UNCTAD (2024), in addition to studies on the digital economy and artificial intelligence. The following subsections explain the main components of the framework and their contribution to supporting economic and institutional decision-making.

4.1. Digital Economy

The digital economy constitutes the starting point of this transformation. It relies on information and communication technologies, the Internet, and digital platforms to facilitate economic activities and the exchange of goods, services, and information. This model has accelerated information flows, reduced transaction costs, expanded digital markets, and generated unprecedented volumes of data from various economic activities. Nevertheless, at this stage, technology primarily serves to digitalize operations and improve efficiency, while decision-making continues to depend largely on human analysis (OECD, 2024), (UNCTAD, 2024).

4.2. Big Data

The expansion of the digital economy has generated enormous volumes of data originating from e-commerce, digital platforms, social media, the Internet of Things, and smart devices. Data is no longer merely a by-product of economic activity but has become a strategic resource that creates economic value and enhances institutional performance. The effectiveness of the algorithmic economy depends heavily on the quality, diversity, and continuous updating of these datasets, as the learning and predictive capabilities of algorithms are directly linked to the quantity and accuracy of available data (World Bank, 2021).

4.3. Artificial Intelligence

Artificial intelligence represents the stage at which raw data is transformed into actionable knowledge. Through machine learning, deep learning, and natural language processing, AI systems have become capable of identifying patterns and relationships that exceed the capabilities of conventional analytical methods. International indicators reveal substantial growth in private investment in AI, together with its increasing adoption across institutions, demonstrating the transition of AI from an experimental technology to a widely implemented economic resource (Stanford AI Index Report, 2025).

4.4. Algorithms and Machine Learning

Algorithms constitute the core of the algorithmic economy, as they process data, generate analytical outputs, and support institutional operations. Modern algorithms continuously improve their performance as larger datasets become available, allowing them to produce more accurate forecasts, identify risks, and evaluate alternative scenarios. Consequently, algorithms have evolved from simple technical tools into a new productive resource that enhance efficiency and foster innovation. (Brynjolfsson & McAfee, 2017)

4.5. Data Analysis and Forecasting

This stage plays a pivotal role in the transition from the digital economy to the algorithmic economy. Raw data is converted into information and knowledge that enables institutions to better understand economic developments and anticipate future trends. Algorithm-based analytics make it possible to process information in real time, thereby improving responsiveness and reducing uncertainty in the business environment. As a result, competitive advantage increasingly depends not merely on possessing data but on the ability to analyze it and extract economically valuable insights (UNCTAD, 2024)

4.6. Economic and Institutional Decision-Making

Decision-making represents the stage where the economic value of algorithms becomes tangible. Institutions increasingly rely on intelligent models to support planning, resource allocation, risk management, demand forecasting, and supply chain optimization. This transformation does not eliminate the human element; rather, it establishes a complementary model in which human expertise and algorithmic analysis work together to produce decisions that are faster, more accurate, and more objective (Stanford AI Index Report, 2025), (OECD, 2024)

4.7. Algorithmic Economy

The algorithmic economy represents the most advanced stage of this transformation, where algorithms, artificial intelligence, and big data become key production factors alongside capital and labor. Within this model, technology no longer serves merely to digitalize economic activities; it actively contributes to generating economic knowledge, shaping decision-making processes, and redefining business models. This ultimately enhances productivity, improves efficiency, and strengthens institutional competitiveness. Therefore, the algorithmic economy should not be viewed as a replacement for the digital economy but rather as its more advanced evolutionary stage, in which economic value shifts from digitalization to intelligent algorithmic analysis.

The proposed framework demonstrates that the transition from the digital economy to the algorithmic economy is driven by the integration of digital infrastructure, data resources, artificial intelligence, algorithms, and institutional capabilities. Rather than operating independently, these components interact to support economic and institutional decision-making, improve efficiency, and enhance economic value creation.

5. Future Prospects of the Algorithmic Economy and Governance Requirements

Building on the previous analysis, it becomes essential to examine the future prospects of the algorithmic economy in light of the rapid advancement of artificial intelligence and the accompanying institutional and regulatory challenges.

The transition toward the algorithmic economy creates significant economic opportunities while simultaneously raising important issues related to algorithmic governance, data protection, and decision transparency. As artificial intelligence becomes increasingly integrated into economic and institutional decision-making, effective governance requires the establishment of appropriate mechanisms for data

management, algorithmic transparency, and accountability in AI-supported decisions, while maintaining an appropriate balance between innovation and the protection of economic and social rights.

International experience demonstrates that successfully leveraging the algorithmic economy depends not only on investment in digital technologies but also on the development of digital infrastructure, the enhancement of human capital, the strengthening of data analytics capabilities, and the establishment of clear governance frameworks for artificial intelligence. Such frameworks are essential to mitigate risks associated with algorithmic bias, privacy violations, and the lack of transparency in automated decision-making (OECD, 2024, pp. 25-31).

International indicators further show that countries that have successfully adopted artificial intelligence have not focused exclusively on technological advancement. Instead, they have developed integrated ecosystems that combine investment, innovation, legislation, and digital skills development, enabling them to maximize economic gains while minimizing the risks associated with digital transformation.

Accordingly, the success of the transition toward the algorithmic economy should not be measured solely by the diffusion of artificial intelligence applications, but rather by the ability of institutions and economies to integrate these technologies within robust institutional and regulatory frameworks that promote efficient use, strengthen trust in algorithm-based decisions, and support more sustainable economic growth.

6. Discussion of the Findings

The analysis indicates that the transition to the algorithmic economy represents a structural transformation in economic and institutional decision-making, driven by the increasing integration of data, artificial intelligence, and algorithms. International indicators show that economic value is increasingly shaped by the ability to collect, analyze, and exploit data to improve performance and productivity. This trend is reflected in the sustained growth of private investment in artificial intelligence and its expanding adoption across institutions (Stanford AI Index Report, 2025), (OECD, 2024)

The findings indicate that the algorithmic economy represents a natural evolution of the digital economy rather than a substitute for it. While the digital economy established the technological foundation for data generation and exchange, the algorithmic economy enhances the economic value of these data through artificial intelligence and algorithms that support forecasting, resource allocation, and decision-making. This interpretation is consistent with the OECD Digital Economy Outlook 2024, which identifies artificial intelligence and data analytics as key drivers of productivity and innovation across institutions. (OECD, 2024).

The findings are further consistent with the contemporary literature, which considers artificial intelligence not merely as a technological tool but as a fundamental component in the development of new business models and the restructuring of economic competition. However, the present study goes beyond confirming this trend by providing an analytical framework that explains the transition from the digital economy to the algorithmic economy. Specifically, it illustrates the

interconnections between the digitalization of economic activities, data generation, the deployment of artificial intelligence and algorithms, and their role in supporting economic and institutional decision-making.

The findings also indicate that success in the algorithmic economy depends not only on the availability of digital infrastructure but also on the capacity of institutions to exploit data and develop algorithmic models capable of generating economically valuable knowledge and translating it into more accurate and efficient decisions. From this perspective, the transition toward the algorithmic economy represents a transformation in the logic of value creation, whereby data and algorithms have become productive resources comparable in importance to capital and labor in the contemporary economy (World Bank, 2021), (Brynjolfsson & McAfee, 2017)

Conclusion

The analysis has shown that the transition from the digital economy to the algorithmic economy is no longer limited to the use of digital technologies in economic activities. Instead, it represents a transformation in institutional management and decision-making processes driven by the growing reliance on data, algorithms, and artificial intelligence. International indicators confirm that this transition is reflected in the continuous increase in investments in artificial intelligence and the widespread adoption of its applications across institutions, signaling a shift toward economic models that increasingly rely on algorithmic analysis to manage resources and improve organizational performance.

Accordingly, the study provides an answer to its central research question by demonstrating that the algorithmic economy has reshaped economic and institutional decision-making models through enhancing institutions' ability to analyze data, anticipate future developments, and allocate resources more efficiently, while preserving the essential role of human oversight in strategic decision-making.

The findings support the proposed hypotheses and confirm the validity of the proposed analytical framework. The analysis confirms that the algorithmic economy represents an advanced stage in the evolution of the digital economy, reflecting the growing role of data, artificial intelligence, and algorithms in economic activities. It also shows that the integration of these technologies improves economic and institutional decision-making by strengthening data analysis, forecasting, and resource allocation. Furthermore, the findings indicate that the success of this transformation depends not only on technological progress but also on the existence of an appropriate institutional and legislative framework that promotes responsible AI governance, ensures data protection, and strengthens transparency and accountability.

Furthermore, the study indicates that competitive advantage in today's economy is no longer determined solely by access to digital technologies. Rather, it increasingly depends on the ability of institutions to transform data into actionable knowledge that supports decision-making. Consequently, the algorithmic economy represents one of the most significant transformations shaping the global economy and calls for

the development of policies and strategies capable of balancing the opportunities offered by algorithmic technologies with the risks associated with their deployment.

Recommendations

- Strengthen investment in digital infrastructure and artificial intelligence capabilities to facilitate the transition toward the algorithmic economy.
- Develop regulatory and governance frameworks that ensure transparency, accountability, data protection, and mitigate algorithmic bias.
- Enhance human capital by integrating artificial intelligence and data analytics into education and professional training.
- Promote the adoption of algorithm-supported decision-making across economic institutions while ensuring effective human oversight.
- Strengthen collaboration among universities, research centers, and economic institutions to foster innovation and develop algorithmic solutions.
- Encourage further research on the economic, institutional, and labor market implications of the algorithmic economy.

References:

- Al-Rakhawi, M. K. A. (2023). The global digital economy: From globalization to artificial intelligence. *Dar Al-Fikr Al-Jami'i*.
- Al-Zatil, A. S. M. (2026). The role of artificial intelligence in enhancing value creation and building competitive advantage in the digital economy. *Journal of Comprehensive Sciences*, 10(39), 619–638.
- Brynjolfsson, E., & McAfee, A. (2017). *Machine, platform, crowd: Harnessing our digital future*. W. W. Norton & Company.
- Chen, N., Hu, M., & Li, W. (2022). Algorithmic decision-making safeguarded by human knowledge. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.428186>
- Lobel, I. (2021). Revenue management and the rise of the algorithmic economy. *Management Science*, 67(9), 5602–5620. <https://doi.org/10.1287/mnsc.2020.3712>
- Luong, A., Kumar, N., & Lang, K. R. (2020). Algorithmic decision-making: Examining the interplay of people, technology, and organizational practices through an economic experiment. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3529679>
- Organisation for Economic Co-operation and Development. (2024). *OECD digital economy outlook 2024: Embracing the technology frontier*. OECD Publishing. <https://doi.org/10.1787/a1689dc5-en>
- Qashi, M. (2023, April). The economics of artificial intelligence: Developments and implications. Paper presented at the University Week on Artificial Intelligence and Science Day, Faculty of Economics, Commercial and Management Sciences, University of Ghardaïa, Algeria.
- Shour, H. K. (2026). Measuring the impact of the digital economy and artificial intelligence technologies on improving economic performance indicators in Iraq. *North African Economies Journal*, 22(41), 89–104.



- Shrestha, Y. R., Ben-Menahem, S. M., & von Krogh, G. (2019). Organizational decision-making structures in the age of artificial intelligence. *California Management Review*, 61(4), 66–83. <https://doi.org/10.1177/0008125619862257>
- Simon, H. A. (1977). *The new science of management decision* (Rev. ed.). Prentice-Hall.
- Stanford Institute for Human-Centered Artificial Intelligence. (2025). *AI Index Report 2025*. Stanford University. <https://hai.stanford.edu/ai-index>
- United Nations Conference on Trade and Development. (2024). *Digital economy report 2024*. United Nations. <https://unctad.org/publications-search>
- World Bank. (2021). *World development report 2021: Data for better lives*. World Bank. <https://www.worldbank.org/publication/wdr2021>