The Impact of Digitalization on the Performance of Foreign Trade in Algeria

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Abstract:

This study highlights digitalization as a pivotal instrument for modernizing foreign trade and enhancing the performance of economic activities. It emphasizes the integration of information and communication technologies into commercial processes in Algeria, where digitalization has become a central component of state efforts to simplify procedures, reduce transaction processing times, and improve transparency in trade exchanges. Electronic systems have contributed to shipment tracking, the digital issuance of declarations and documentation, and the facilitation of communication among stakeholders across the supply chain, thereby strengthening the international competitiveness of Algerian enterprises.

The study concludes that Algeria's adoption of digital platforms in the field of foreign trade constitutes a key driver for improving economic performance and reinforcing the competitiveness of national operators in international markets. This orientation also reflects a clear political commitment to transitioning toward modern governance based on efficiency and transparency, as well as leveraging information and communication technologies as a strategic tool to support sustainable economic development.

Keywords: Digitalization; Foreign Trade; Algeria; Imports and Exports.

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1. INTRODUCTION

The world has witnessed rapid transformations affecting political, economic, cultural, and social spheres, driven by the information revolution and technological advancement. In response, countries have hastened to keep pace with these developments, viewing their adoption as an imperative to benefit from the advantages they offer. Among the most significant outcomes of the information and communication technology (ICT) revolution is digitalization, which has been widely embraced by governments and institutions alike. The adoption of digitalization and electronic management mechanisms represents one of the most prominent technological transformations of the modern era, given their effective role in bringing about a qualitative shift within institutions, business organizations, and public administrations.

These transformations have contributed to enhancing efficiency and effectiveness across various sectors by focusing primarily on improving institutional performance, particularly at the organizational level. This progress is directly reflected in the quality of services and products delivered, owing to the multiple capabilities offered by digitalization, such as simplifying administrative procedures, eliminating paper-based transactions, accelerating task completion, and reducing operational costs. Moreover, its impact extends to the operational dimension through the use of modern technologies and equipment in task execution, thereby generating mutual benefits for all stakeholders, including economic institutions, government bodies, and other actors associated with organizational activities.

Like other countries striving to achieve development and progress across different fields, Algeria has found itself facing an unavoidable strategic choice: the adoption of digitalization to keep pace with global digital transformation, particularly as a means of supporting and strengthening the national economy. In this context, public authorities have initiated programs and plans aimed at modernizing various economic sectors through the launch of digital transformation projects and the adoption of electronic management models, with an emphasis on their mandatory implementation. This orientation seeks to bring about positive

change at both cultural and organizational levels, thereby improving the performance of public and private institutions alike.

Foreign trade constitutes one of the fundamental pillars of international economic activity, as the level of economic growth and prosperity of any country is closely linked to the development of its trade relations with the rest of the world. Interest in the volume of external trade is no longer limited to its role as an indicator of economic strength and stability; it has also come to reflect a country's strategic position within the global economic and political system. In light of the rapid transformations shaping the international trade landscape, achieving superiority in foreign trade and capturing larger shares of global markets has become a clear indicator of a country's ability to enhance its economic influence and shape global trade dynamics.

The Importance of the Study:

The significance of this study stems from its alignment with the emergence of Algeria's economic digitalization project across various sectors, accompanied by a clear governmental orientation toward prioritizing the digital transformation of the foreign trade sector. This sector is considered strategic and sensitive due to its direct impact on the national economy and Algeria's international economic relations. In this regard, public authorities have initiated several programs and action plans aimed at integrating digitalization and implementing electronic management systems within the foreign trade sector, in order to keep pace with global technological developments and capitalize on the advantages offered by digital solutions.

These efforts seek to enhance the efficiency of Algeria's foreign trade by simplifying and accelerating administrative procedures, reducing processing times, and lowering the overall costs associated with commercial operations, thereby ensuring the delivery of integrated services characterized by efficiency, effectiveness, and transparency. Accordingly, this study aims to highlight the importance of this digital transformation, analyze its role in improving foreign trade performance, and assess its

impact on strengthening economic competitiveness and supporting the path toward sustainable economic development.

Objectives of the Study:

This study aims to clarify the concept of digitalization, its importance, and its key characteristics, shed light on the current state of digitalization within the Algerian public administration, considering it a strategic option and a key driver for modernizing administrative practices and enhancing their performance, and highlight the impact of digitalization on improving foreign trade performance in terms of procedural simplification, time reduction, and cost minimization.

Problem of the Study:

The contemporary world is experiencing rapid transformations across economic, social, and technological domains, with digital transformation emerging as one of the most prominent developments due to its central role in enhancing performance and efficiency. Algeria has not remained isolated from these changes, as it has accelerated the adoption of digitalization across several sectors, particularly within the economic sphere. The foreign trade sector is among the most affected by this transformation, given its close association with administrative procedures, customs operations, and international commercial transactions. Accordingly, the core research problem of this study lies in assessing the extent to which digitalization has influenced the foreign trade sector in Algeria.

Main Research Question:

To what extent has digitalization contributed to enhancing foreign trade in Algeria?

Sub-questions:

1. What is meant by digitalization?
2. When did the digital system emerge in Algeria?
3. How has the foreign trade sector in Algeria been affected by digitalization?

Hypotheses:

There exist technical and economic challenges and constraints that limit the Algerian government's capacity to keep pace with digital

transformation, thereby impeding efforts to enhance sustainable development and advance the level of foreign trade.

2.Conceptual Framework of the Study:

2.1 Definition of Digitization:

The concept of digitization has been the subject of extensive debate among scholars, owing to its multifaceted and interrelated dimensions. The emergence of numerous related concepts has often led to confusion and conflation with digitization itself. Therefore, it is necessary to comprehensively address the various aspects of this concept in order to clarify its meaning and remove conceptual ambiguity.

- **Linguistic Definition of Digitization:**

In Arabic linguistic dictionaries, the term “raqam” encompasses a range of meanings, most notably numeration, clarification, writing, inscription, and marking. Ibn Manẓūr explains that “al-raqm” and “al-tarqīm” refer to the process of rendering a text into Arabic script (i.e., Arabicization). He further states that “raqama al-kitāb” denotes the act of numbering and annotating a book, so that “kitāb marqūm” signifies a text whose letters have been made explicit through diacritical marks. The Qur’anic expression “kitāb marqūm” is interpreted as a written and inscribed book, while “al-marqūm” refers to the pen. In another usage, “al-raqm” denotes writing or stamping, and it also refers to a patterned engraving on leather. Accordingly, “raqama al-thawb” refers to marking a garment with distinctive lines or patterns.(1)

- **Terminological Definition of Digitization:**

Saeed Yaqteen defines digitization as the process of transferring any category of documents into a digital format. In this process, still or moving images, audio recordings, or files are encoded into numerical values, as this transformation enables documents—regardless of their type—to be accessed and utilized through information systems. Accordingly, the digitization of text refers to converting printed or manuscript material from its paper form into a digital format, thereby making it viewable on a computer screen.(2)

"Charlotte Percey" defines digitization as a methodology that enables the transformation of data and information from an analog system to a digital

one. Doug Hodges offers another definition, adopted by the National Library of Canada, in which digitization is described as a process or procedure for converting intellectual content stored on traditional physical media—such as journal articles, books, manuscripts, and maps—into digital form. In other words, digitization is the process of converting data into a digital format for processing by a computer.(3)

- **Importance and Characteristics of Digitization**

Digitization holds considerable importance, which can be summarized as follows:

- Digitization has become an increasingly valuable initiative for information institutions of various types. It is also highly significant among subscribers and information professionals, as information is made available in electronic form. Numerous initiatives, such as the concept of the information superhighway, have driven the conversion of many information sources from traditional formats to collections accessible via modern digital media.
- Digital collections are characterized by their ease of access for users and the ability to be shared among multiple users simultaneously. Consequently, they can accommodate the growing number of users more effectively than traditional collections. This is achieved by publishing and providing access to text collections online through the World Wide Web or via an institution's internal network.
- Digitizing an information source that exists on traditional physical media enhances its usability by facilitating access and consultation. It enables full-text search and retrieval within information sources and supports the use of hyperlinks that direct the reader to relevant texts, as well as to external resources related to their research topic. Digitization is not merely a means of replacing traditional library holdings and services with electronic collections and services; rather, its primary function lies in the development and enhancement of the services provided.(4)
- Saving time: The conversion of documents into digital format enables their retrieval within seconds, facilitates simultaneous access by multiple users, and allows researchers to consult digital copies online.(5)

The characteristics of digitization can be summarized as follows:

- Cognitive Tasks with Machines: Digitization facilitates interaction and dialogue between researchers and artificial intelligence systems, enabling information technology to contribute to the advancement of knowledge and enhancing users' capabilities in a comprehensive manner. This interaction supports greater control over the production process and strengthens the potential for knowledge creation.
- Formation of Communication Networks: Information technology-based devices and systems converge to form communication networks. This integration increases the flow of information among users, industry stakeholders, and equipment manufacturers, and facilitates the exchange of information with other sectors and activities.
- Interactivity: Users of digital technologies can act simultaneously as senders and receivers, allowing participants in communication processes to interchange roles. This feature enables a high degree of interaction between different activities.
- Asynchronicity: Digitization enables messages to be received at any time that suits the user, meaning that participants are not required to use the system concurrently. This temporal flexibility enhances accessibility and convenience.
- Decentralization: Digitization supports the independence and autonomy of information and communication technologies, allowing distributed access and management rather than centralized control.
- Interoperability: Digitization enables the connection and compatibility of communication devices regardless of their manufacturer or country of origin, thus supporting global integration and collaboration.
- Mobility: Users can benefit from digital services while on the move, accessing them from any location through various communication means such as laptops, mobile phones, and other portable devices. (6)
- Paperless Administration: Digitization relies on new administrative mechanisms for executing procedures and transactions, including computers, mobile phones, information and communication technologies, email, voice messaging, and other electronic tools. This

transition reduces dependence on physical documentation and streamlines administrative workflows.

- Time- and Location-Independent Administration: Digitization enables administrative processes to operate continuously and from any location, allowing decisions to be made across various domains without being constrained by time or distance. This also eliminates the need for direct, face-to-face interaction between parties involved in a transaction.
- Flexible Administrative Structures: Digitization contributes to organizational excellence by facilitating fundamental transformations in work organization and process execution. It supports the development of more adaptive and less rigid administrative structures, enabling organizations to respond more effectively to changing environments and demands.(7)

2.2 Concept of Foreign Trade:

Foreign trade has attracted substantial attention from scholars due to its critical role as a primary driver of economic growth and development. It plays a positive and significant role in the organization and utilization of economic resources, thereby contributing to the overall enhancement of economic performance.

- **Definition of Foreign Trade:**

Foreign trade can be defined as the process of exchanging goods and services between countries, governed by a set of policies, laws, and regulations established through bilateral or multilateral agreements. It is considered a component of microeconomics, as it focuses on specific economic units such as export and import activities, among others.(8)

In addition, Dr. Al-Sayyid Muhammad Ahmad Al-Sreiti defines foreign trade as a branch of economics that specializes in the study of international economic transactions. This includes the movement of goods, services, and capital across different countries, as well as the trade policies implemented by nations to influence these flows of goods, services, and capital.(9)

On the other hand, foreign trade refers to the commercial exchange of goods, services, and other factors of production between multiple countries, with the objective of generating mutually beneficial outcomes for all participating parties. (10)

A more comprehensive definition conceptualizes foreign trade as a system

of commodity–monetary relations encompassing the totality of international trade conducted by all countries worldwide. Foreign trade may be undertaken by individuals, private entities, governments, and various international organizations. Consequently, international economic and commercial relations are constituted by the interactions among the diverse components of economic activity across countries, as well as the relations between these countries themselves. This includes the movement of factors of production—such as labor and capital—at the international level, alongside international monetary and credit relations, and productive and scientific-technological cooperation.(11)

Additionally, foreign trade is broadly defined as international commercial transactions in their three principal forms: the movement of goods, individuals, and capital. These transactions occur between parties residing in different political units, including individuals, governments, or economic organizations situated in distinct jurisdictions.(12)

In the context of trade administration, the term foreign trade refers to internationally exchanged commercial operations, specifically the cross-border exchange of goods and services in a general sense. When such exchange occurs between a particular country and one or more other countries, it is referred to as foreign trade or international trade.(13)

- **Objectives of Foreign Trade:**

The objectives of foreign trade can be summarized as follows:(14)

- Maximizing the benefits of production surpluses: Export activities enhance national output, thereby improving employment levels and enabling the supply of essential goods. Conversely, weak export performance can reduce national income, diminish the contribution of trade to the economy, increase unemployment, and lower living standards.
- Importing essential goods that cannot be produced domestically: Certain products are not locally producible due to technical, natural, or economic constraints. For instance, importing machinery and equipment necessary for establishing a textile factory can create numerous employment opportunities and subsequently support export growth, income generation, and national output expansion.
- Import substitution: This objective depends largely on production costs. When goods can be produced domestically at reasonable costs, local

production may entail administrative, capital, and technical challenges but can promote trade policy goals and stimulate significant export activity. In contrast, some products may be domestically producible but at higher costs than imports; in such cases, government policy plays a crucial role, a situation commonly observed in developing countries.

- Technology transfer and infrastructure development: Foreign trade facilitates the acquisition of advanced technologies and techniques required to build and restructure national infrastructure.
- Utilizing information technology as a developmental strategy: Information technology represents a vital pathway for developing countries to narrow the gap with advanced economies. For example, India has successfully exported software and competed effectively with developed countries in the global market.
- Analyzing balance of payments and exchange rate systems: Foreign trade involves studying countries' balance of payments, exchange rate regimes, and addressing imbalances to restore equilibrium.
- Evaluating trade policies: This includes examining trade policies adopted by countries—such as protectionism or trade liberalization—and their impact on international commerce.
- Studying international relations within economic blocs: Foreign trade research also addresses the characteristics and dynamics of international economic groupings and regional integration frameworks.

3. The Beginning of the Digital Transformation in Algeria:

Digitization emerged as a result of historical developments within information institutions. The early adoption of computers in the United States and the United Kingdom during the 1950s marked the beginning of this transformation, particularly within administrative and library-related activities. These technological advances enabled the replacement of paper-card catalogues with electronic records, allowing libraries to participate in networked cataloguing systems and to exchange bibliographic information, thereby facilitating collaborative indexing and interlibrary lending.

The initiative gained further momentum through the "Universal Library" project endorsed by the Group of Seven (G7) countries. This project aimed to standardize catalogues and textual records across global libraries, thereby enabling all sources to be searchable online through intensified digital linkage among libraries, ultimately expanding access to knowledge.

Building on ongoing international cooperation, the Brussels conference of 1995 was convened to support economic, social, scientific, and cultural development. The United States supported the project with funding from the National Science Foundation and the National Aeronautics and Space Administration (NASA), under the Department of Defense. The initiative included the establishment of six digital libraries designed to support scientific research and higher education, supported by prominent American institutions. Subsequently, the experience spread to Europe through analogous initiatives, such as the "Memoria" project, involving the Bibliothèque nationale de France, the Oxford Text Archive, the Toulon Institute for Scientific Research, and other information institutions. These efforts reflected a strategic orientation toward preserving intellectual output across specialized fields and subjects. As a result, numerous libraries later became linked to major digital library projects on a large scale.(15)

Subsequently, digitization spread to Europe through analogous initiatives collectively referred to as the "Memoria" (mimoria) project. This effort involved the Bibliothèque nationale de France, the Oxford Text Archive, the Toulon Institute for Scientific Research, and various specialized information institutions. The initiative aimed to systematically preserve electronic intellectual output by creating digital archives that consolidate scientific, literary, and historical texts and documents within clearly defined subject domains. In doing so, it sought to ensure long-term access to and preservation of these materials.(16)

The "Memoria" initiative reflects a broader European orientation toward the development of digital library infrastructure. Digitization in Europe has transcended the mere conversion of printed materials into digital formats; it now encompasses the construction of comprehensive digital content management systems, the application of standardized descriptive metadata, the deployment of technologies for long-term digital preservation, and the facilitation of open access to resources. Consequently, the initiative became linked to major digital library projects involving libraries and publishing houses in advanced countries, including collaborative efforts between national and university libraries and the development of shared platforms

for resource exchange. These efforts have significantly contributed to enhancing scholarly research and expanding global access to intellectual output.

Algeria has not remained isolated from these major global transformations. Like other countries, it has been swept into the digital wave that has reshaped lifestyles and communication patterns over the past two decades. At the beginning of the twenty-first century, digital technologies gradually began to penetrate Algerian society, later achieving widespread adoption with the proliferation of smartphones and the expansion of internet connectivity across the country. This transformation was not merely technological; it also reshaped the social fabric by redefining citizens' access to information, their engagement with public affairs, and their participation in the formation of public opinion.

For decades, Algerian public administration remained bound to traditional practices based on paper-based transactions and complex bureaucratic procedures, with public services characterized by long queues and extensive documentation. However, the shift toward digitization marked a clear break from this reality, as the state began introducing e-services and modernizing administrative processes. Citizens have increasingly been able to complete a substantial number of transactions remotely through digital platforms launched by official institutions, including the Ministry of Interior and agencies responsible for digital transformation. The launch of national programs dedicated to digitization also reflects official recognition of the necessity to keep pace with global technological developments.

- **The "Electronic Algeria project" (2008–2013):**

The Electronic Algeria project (2008–2013) represents a prominent model of Algeria's early digital transition, reflecting the political will to embark on a comprehensive digitalization trajectory and to align with contemporary global trends. The project was designed around several key objectives, including:

- Ensuring effectiveness and quality in the provision of administrative services to citizens through the simplification, acceleration, and facilitation of bureaucratic procedures.
- Promoting coordination among ministries, administrative bodies, and

public institutions during program implementation.

- Eliminating bureaucratic obstacles and reducing administrative red tape.
- Ensuring the program's comprehensiveness across various administrative domains and service areas.

- **National Strategy for Digital Transformation in Algeria (2025–2030):**

In 2025, Algeria embarked on a rapid and organized push toward a comprehensive digital transformation, driven by the strict directives of President Abdelmadjid Tebboune to complete the expansion of digitization within an integrated strategic framework. This vision reflects a clear political commitment to modernize public administration, consolidate transparency, and curb the persistent challenges of corruption and bureaucracy that have historically hindered administrative efficiency.

The President has placed digitalization at the core of structural state reform, viewing it as a fundamental pillar for enhancing administrative effectiveness and improving the quality of public services. He has repeatedly emphasized the urgency of accelerating the adoption of digital tools across all sectors, stating that the widespread use of digitization is an indispensable necessity, and that integrating all sectors is not an optional choice. The President further asserted that digitalization is no longer a matter of debate but a mandatory requirement imposed by the demands of the contemporary era. He also strongly rejected any justifications for delays in joining this national transformation path.(17)

The National Strategy for Digital Transformation is structured around five strategic axes. Two of these axes constitute the foundational prerequisites for successful digital transformation in Algeria. The first concerns basic infrastructure, primarily high-quality communication networks and data centers. The second focuses on human resources, training, and research and development.

The remaining three axes target the core components of the state. These include:

1. Public authorities, which govern and manage through the axis of digital governance;
2. The economy, which generates wealth through the axis of the digital

economy;

3. Civil society, which aims to achieve digital inclusion through the axis of the digital society.

Each axis comprises a set of strategic objectives, totaling twenty-five (25) strategic goals, each intended to be achieved within the 2025–2030 period.

The overarching aims of implementing this national strategy are to realize a set of values including transparency, administrative efficiency, justice, and equality, thereby stimulating the national economy and ensuring sustainable social and economic development.

The strategy is founded on two principal pillars. The first is a comprehensive legal and regulatory framework that governs, structures, and regulates digitization in Algeria. This pillar is currently being advanced by the High Authority for Digitization through the preparation of a digitization law, developed with the participation of all relevant stakeholders.

The second pillar is digital security, which constitutes a crucial foundation for safeguarding the strategy's axes. This involves protecting data and systems from cyber threats. This component is addressed by the National Strategy for Information Systems Security (2025–2029), adopted by the National Council for Information Systems Security.(18)

Given the reforms implemented and the digital projects launched in Algeria since the early 2010s, tracking Algeria's ranking in the United Nations E-Government Development Index (EGDI) for the period 2010–2024 is of critical importance. This index provides an objective and neutral measure of the success of national policies and strategies in the field of digital transformation. Digital transformation is not limited to the deployment of platforms or applications; rather, it is an integrated process that encompasses the development of digital infrastructure, the reengineering of administrative procedures, the expansion of electronic services, and the enhancement of institutional capacities for data management and exchange. It also involves improving transparency and citizen engagement.

Within this framework, the UN E-Government Development Index enables the assessment of state performance across a set of criteria related to infrastructure, the quality of online services, and the capacity for citizen participation. Accordingly, Algeria's ranking in this index serves as a mirror

reflecting the progress achieved relative to previous years and against international benchmarks.

Based on this rationale, the following table presents Algeria's ranking in the E-Government Development Index for the period 2010–2024. This provides an objective basis for analyzing the trajectory of government digital transformation, identifying strengths and weaknesses, and evaluating the extent to which national digital policies align with international standards and global best practices.

Table (1) shows Algeria's ranking in the E-Government Development Index for the period (2010–2024):

Year	Ranking	E-Government Development Index EGDI	Online Service Index (OSI	Telecommunication Infrastructure Index TII	Human Capital Index HCI
2010	131	0.3181	0.0355	0.0412	0.2435
2012	132	0.3608	0.2549	0.1812	0.5463
2014	136	0.3156	0.0787	0.1989	0.6542
2016	150	0.2999	0.0652	0.1934	0.6412
2018	130	0.4227	0.2153	0.3889	0.6640
2020	150	0.2999	0.0652	0.1934	0.6412
2022	130	0.4227	0.2153	0.3889	0.6640
2024	116	0.5956	0.3320	0.8129	0.6418

Source: (UNDESA ،E-Government Survey (2012,2014,2016,2018,2020,2022,2024), from: https://publicadministration.un.org/egovkb/en-us/Reports/UN-E-Government-Survey

The table illustrates Algeria's developmental trajectory in the United Nations E-Government Development Index (EGDI) over the period 2010–2024, revealing notable fluctuations in the country's ranking before a marked improvement in recent years. During 2010–2014, Algeria's ranking gradually declined from 131 in 2010 to 136 in 2014, reflecting a relatively low and stagnant level of e-government development compared with other

countries. This trend likely indicates limited digital services and underdeveloped infrastructure during that period.

The years 2016 and 2020 witnessed further deterioration, with the ranking falling to 150—the lowest position recorded throughout the period. This decline may suggest relative underperformance in e-government delivery or delays in implementing digital initiatives, potentially due to technical challenges, bureaucratic inertia, or weak integration of digital systems within public administration.

However, the table shows a significant reversal beginning in 2018 and 2022, when Algeria's ranking improved to 130, followed by a substantial leap to 116 in 2024. This late improvement reflects the impact of recent reforms and digital initiatives undertaken by the Algerian government. The most recent advancement can be attributed to strengthened digital infrastructure, expanded electronic service provision, and enhanced quality of digital interaction with citizens and institutions, all of which contributed to the country's improved international standing.

The data derived from the sub-indices (OSI, TII, and HCI) over the study period indicate (2010-2024) a notable improvement in the level of digital government services provided online, as well as in citizen satisfaction with these services. Furthermore, the data reflect the state's sustained efforts to provide all technical means enabling citizens to access government services and to enhance communication quality, the most recent of which being the activation of fifth-generation (5G) technology, thereby increasing its appeal for technology investments. The data also reveal a progressive correlation between the health and education of children and their subsequent productivity as workers, which positively impacts the state's economic development and further incentivizes increased investment in health and education.

4.The Reality of Digitalization Implementation in Algeria's Foreign Trade:

Algeria is progressively moving toward the digitalization of foreign trade by launching digital platforms to manage import operations, particularly for raw materials, with the aim of enhancing transparency and operational efficiency. Concurrently, the customs information system

"ALSAS" has been modernized to simplify procedures and reduce bureaucratic obstacles, thereby supporting domestic production and strengthening competitiveness. The government also plans to introduce additional platforms to facilitate the import of services and online retail transactions, thereby completing an integrated digital trade ecosystem. Nevertheless, these efforts face significant challenges, particularly related to the digital infrastructure required to support such transformation.

4.1 Dedicated Digital Platforms:

As part of its broader reform of the foreign trade system and in response to global shifts in economic governance, Algeria has adopted digital platforms and electronic tools to manage both import and export operations. This initiative aligns with a national strategy aimed at modernizing economic administration, enhancing the effectiveness of public policies, and strengthening the integration of the national economy into international exchanges. The application of digital technologies has enabled a qualitative transformation in management mechanisms, transitioning from traditional paper-based procedures to integrated information systems that facilitate real-time data exchange among stakeholders, including economic operators, public administrations, regulatory bodies, and financial and customs institutions.

These digital platforms are designed to streamline administrative procedures by reducing the number of required documents, accelerating processing times, and enabling operators to track their transactions electronically without the need for repeated physical visits to administrative offices. In addition, these tools contribute to improved transparency and good governance by standardizing databases, ensuring traceability of trade operations, and reducing informal practices, thereby enhancing the business environment and reinforcing economic actors' confidence in public institutions. Moreover, digitization serves as an effective mechanism for reducing administrative bureaucracy by minimizing direct human intervention, limiting overlapping authorities, and improving institutional coordination among the various entities involved in foreign trade.

Thus, Algeria's reliance on digital platforms in foreign trade represents a

crucial lever for improving economic performance and enhancing the competitiveness of national operators. It also reflects a clear political will to transition toward a modern administrative model based on efficiency, transparency, and the strategic use of information and communication technologies to support sustainable economic development. The following section highlights the most important digital platforms adopted in Algeria to facilitate foreign trade:

- **The Digital Platform for Managing and Monitoring the Importation of Raw Materials and/or Production Inputs and Equipment:**

This platform was developed by the Ministry of Foreign Trade and Export Promotion to regulate the import process in the fields of equipment ("Equipement") and/or operations ("Fonctionnement"). It is designed to monitor the importation of raw materials, ensuring transparency, rapid processing, and data accuracy in relation to the provisional programs for the first half of 2026, for economic enterprises engaged in production. The platform is exclusively dedicated to enterprises holding the commercial registry activity code No. 01 and activity code 07, thereby directing imports toward the actual needs of national production and contributing to the support and competitiveness of the national economy. The launch of this platform is part of the state's policy to modernize foreign trade management and transition to an effective digital administration that serves economic operators and supports domestic production.(19)

- **The Digital Platform for Managing the Special Export Promotion Fund (FSPE):**

The Special Export Promotion Fund (FSPE) was established under the 1996 Finance Law. Its resources are allocated to provide financial support to exporters for activities related to the promotion and marketing of their products in international markets.

State subsidies are granted through the FSPE to any resident company that produces goods or provides services, as well as to any trader who is duly registered in the commercial register and actively engaged in export

activities. The amount of state support available is determined under the supervision of the Ministry of Commerce and according to pre-established rates based on the available financial resources. Several types of subsidies are defined, notably including:

- Expenses related to market research in foreign markets.
- Partial coverage of participation costs in international exhibitions.
- Partial funding for costs associated with foreign market studies.
- International transportation costs for loading and shipping goods from Algerian ports for export.
- Financing costs related to adapting products to the requirements of foreign markets.(20)

The new digital platform is not merely a mechanism for processing applications; rather, it constitutes an integrated system designed to accelerate transaction processing, improve data accuracy, and enhance transparency among economic operators. This contributes to balancing national needs with economic priorities at both the macroeconomic and sectoral levels. The platform is also designed to be interoperable with other sectors, thereby facilitating cross-sectoral integration.

Furthermore, the platform contributes to improving the national balance between supply and demand by providing authorities with accurate information regarding the country's actual requirements. This enables more efficient resource allocation and supports sustainable economic development. It has been emphasized that digitalization represents a structural transformation in the management of foreign trade, strengthening the effectiveness of economic policies and elevating the level of oversight and transparency in transactions.(21)

4.2 Customs Modernization:

The customs sector is among the most affected by digital transformation due to its strategic role in regulating trade exchanges, securing national borders, and balancing the dual imperatives of trade facilitation and regulatory oversight to protect the domestic economy. In this context, many countries have adopted advanced information systems to streamline customs procedures, accelerate transaction processing, and

reduce human intervention. These systems contribute to shorter clearance times, lower costs, and more effective prevention of fraud and smuggling. In line with these global trends, Algeria has initiated a comprehensive digital modernization of its customs framework, culminating in the establishment of an integrated information system known as ALCES (Advanced Logistics and Customs Electronic System). ALCES represents the cornerstone of Algeria's customs digitalization trajectory.

- **ALCES System:**

The new Algerian customs information system, ALCES, is an effective tool designed to facilitate and simplify customs procedures associated with foreign trade. It has enabled the digitalization of import and export processes, from the submission of customs declarations to the release of goods, thereby enhancing the smoothness and efficiency of trade operations. This digital transformation is pivotal in improving the competitiveness of economic operators by reducing costs, shortening customs clearance times, and ensuring compliance with established deadlines. Such improvements strengthen the confidence of international partners and expand opportunities for access to foreign markets.

ALCES is founded on three principal pillars: (1) the establishment of a centralized data storage center, (2) the interconnection of all customs services nationwide through a high-performance communication network based on fiber optics and supported by Algeria's satellite Alcomsat-1, and (3) the development of specialized software that enables comprehensive electronic processing of all customs procedures for imports and exports. This technical integration consolidates an effective digital customs administration that combines technological advancement with improved administrative performance, responding to the expectations of economic operators and various stakeholders.

Moreover, the system plays a central role in enhancing transparency in monitoring foreign trade operations and in improving the effectiveness of combating economic crimes, particularly those related to invoice inflation and capital flight. ALCES also aligns with international standards and global best practices in customs processing for goods and travelers by providing modern electronic services. These include mechanisms for electronic payment of customs duties, fees, and tariffs collected by customs authorities, as well as enabling economic operators to track the status of import and export consignments through dedicated electronic interfaces within the system.[(22)]

The importance of digitalization in facilitating import and export procedures is manifested through the simplification of customs clearance processes, enhanced transparency of operations, reduced transaction times, and diminished risks of corruption and evasion. Additionally, it enables economic operators to track their shipments electronically and manage logistical operations more efficiently. Digitalization also strengthens integration among the various entities involved in foreign trade, including customs authorities, the finance sector, banking institutions, and transport services, which positively impacts the volume of trade flows.

In this context, assessing the impact of digitalization on Algeria's exports and imports is of particular significance, as it allows for monitoring the extent to which digital reforms have influenced foreign trade performance during the period 2010–2025. The following table provides a quantitative reading of this relationship by comparing the evolution of exports and imports with the stages of digital transformation experienced by Algeria, including public administration modernization projects, customs digitalization, the shift toward e-government, and the accompanying developments in digital infrastructure and electronic services.

Table (2) illustrates the impact of digitalization on Algeria's exports and imports during the period (2010–2024): (Unit: Million US Dollars)

Year	Exports	Imports	Trade Balance
2010	57091	38885	18026
2011	72888	46927	25961
2012	71736	51569	20167
2013	64713	54993	9720
2014	59996	59670	326
2015	34566	52649	18083-
2016	29310	49436	20126-
2017	34569	48982	14413-
2018	41146	48292	7146-
2019	35323	44323	9000-
2020	21932	35421	13489-
2021	38637	37405	1232
2022	65716	38757	26959
2023	55554	42842	12712

2024	49066	45334	3732

Source: Prepared by the researcher based on data from the annual report of the Bank of Algeria, available: https://www.bank-of-algeria.dz/wp-content/uploads/2025/09/Rapport-2024-AR.pdf

The table illustrates the evolution of exports, imports, and the trade balance over the period 2010–2024. During the initial years of the study period (2010–2014), Algeria consistently recorded a trade surplus, driven by higher export volumes relative to imports, with the surplus peaking in 2011. However, this positive trend underwent a radical reversal beginning in 2015, when the trade balance shifted to a structural deficit that persisted until 2019. This shift can be largely attributed to a sharp decline in exports from 2014 onwards, while imports remained relatively elevated, reflecting a structural imbalance in foreign trade.

In 2020, Algeria experienced a pronounced trade deficit, primarily due to a significant decline in exports—especially hydrocarbons—concurrently with a steep drop in global oil prices. Conversely, the period 2021–2022 witnessed a notable improvement in the trade balance, driven by rising prices of oil and natural gas and increased external demand, particularly from European markets. Nevertheless, this positive trend weakened during 2023–2024. Although the trade balance remained positive, its surplus diminished compared to 2022 due to lower energy export prices and higher import values. This performance is largely explained by the structural composition of the Algerian economy, which remains heavily dependent on hydrocarbons, accounting for over 90% of total exports, while imports are dominated by manufactured goods, capital equipment, and consumer products. Consequently, improvements in the trade balance are closely tied to fluctuations in global energy prices—rising when prices are high and declining when oil prices fall, as observed in 2024.

The move toward digitalization, particularly in public administration, customs, and foreign trade, constitutes a pivotal factor in improving the efficiency of trade operations and reducing the costs and time associated with external exchanges. Nevertheless, Algeria's trade balance performance during 2020–2024 indicates that the impact of digitalization cannot be disentangled from the structural features of the national economy and

global market conditions. This underscores the need for a comprehensive analysis that integrates structural, digital, and contextual factors.

Therefore, the impact of digitalization on Algeria's exports and imports is clearly reflected in enhanced trade efficiency and reduced procedural barriers. However, it intersects with structural factors—namely the heavy reliance on hydrocarbon exports—and cyclical factors—particularly energy price volatility—that determine the overall direction of the trade balance. Accordingly, digitalization should be regarded as a supportive mechanism that enhances competitiveness and facilitates trade, but it does not substitute for the need to diversify the productive base and export structure, and to strengthen non-hydrocarbon sectors in order to achieve a deeper and more sustainable impact on trade balance performance.

Conclusion:

This study demonstrates that digitalization has become a fundamental driver in modernizing Algeria's foreign trade. It has contributed to restructuring management mechanisms, simplifying customs and trade procedures, enhancing transparency, and reducing transaction times. Nevertheless, digital transformation in foreign trade continues to face structural constraints related to digital infrastructure and its uneven readiness, as well as the need to develop human capacities and update regulatory frameworks to ensure that digital platforms align with national economic requirements and global trade standards. Completing this transformation therefore requires strengthening the digital ecosystem through a comprehensive strategy that includes legislative reform, infrastructure development, and expanding digital platforms to cover all stages of import and export processes, thereby ensuring effective and sustainable integration.

The study reached the following conclusions:

- Digitalization represents a genuine opportunity to redirect foreign trade toward higher efficiency and effectiveness, provided that political will and sufficient resources are available to overcome structural challenges and achieve a qualitative transition toward an integrated digital economy.

- The effectiveness of digitalization remains limited due to structural constraints, including weak digital infrastructure readiness, uneven internet access across regions, and insufficient integration of systems between government institutions and the private sector. Moreover, inadequate digital training and skills development hinder the full exploitation of available capabilities.
- Despite technical and economic obstacles, the future appears promising. All indicators suggest that Algeria is steadily advancing toward a comprehensive digital era. The government recognizes that the digital revolution is not optional but a necessary condition for achieving sustainable development and enhancing the competitiveness of the national economy internationally. Consequently, it has begun implementing policies and measures aimed at expanding digitalization across various sectors, including foreign trade, through the launch of specialized electronic platforms, modernization of information systems, and development of digital infrastructure.

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