National conference on: Digital Economy and its Impact on the Economy and International Trade in Algeria - Challenges and Prospects - November 27, 2024 - PEDAA Laboratory, University of El Oued

The Role of E-Government in Promoting the Digital Economy in Algeria

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Abstract:

This paper examines the role of e-government policies in promoting the digital economy in Algeria. It examines Algeria's progress in implementing digital government services and developing its digital strategy to support economic transformation. The study uses indicators such as the e-Government Development Index (EGDI) to assess Algeria's position globally. Key developments in Algeria's digital landscape are examined, including the expansion of internet connectivity, the growth of e-commerce channels, and the emergence of digital financial services The paper finds the relationship between e-government efforts and the dynamics of the digital economy In Algeria. While challenges remain, the continued growth of digital government capabilities and infrastructure provides an enabling environment for the expansion of the digital economy. The study highlights opportunities to further develop e-government and the digital economy in Algeria through strategic planning and investment in infrastructure.

Keywords: E-government; E-economy; E-commerce; digital services; economic evolution.

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1. INTRODUCTION

Like many developing countries, Algeria embraces digital transformation to modernize its economy and enhance public services. E-government initiatives play a crucial role in this process, acting as a catalyst for the growth of the digital economy. By leveraging ICT, the Algerian government aims to streamline administrative processes, improve transparency, and increase citizen engagement. These efforts not only enhance the efficiency of public services but also create a favorable environment for digital innovation and entrepreneurship. In Algeria's digital transformation, e-government is a cornerstone for building infrastructure and promoting digital solutions while fostering digital literacy in various sectors. To explore the current state of e-government in Algeria and its impact on the emerging digital economy, we pose the following question: **What challenges and opportunities lie ahead for e-government in Algeria in terms of harnessing technology for economic development?**

To answer the question at hand, the descriptive method was used to theoretically familiarize ourselves with the topic by introducing concepts that pave the way for the discussion of the topic, and the descriptive method is best suited to describe the phenomenon as it is, while the analytical method was used to deconstruct the available data and try to relate it to the topic of the study to achieve the desired objectives

2. Digital Government and Economy

technological advances, especially in Information Communication Technology (ICT) have completely changed the way business and government work, The advent of the internet, cloud computing, and big data analytics has enabled e-government to improve public sector efficiency and digitalization. The digital economy has grown transforming traditional business processes Collectively, these developments have changed the political and economic landscape, increasing their connectivity, efficiency, and accessibility.

2.1 The digital government

The organization described digital government as “Digital governance refers to the use of digital technologies as an integrated part of the modernization process of governments to deliver effective and efficient public services. It involves a shift from traditional e-government practices to a more comprehensive digital ecosystem that facilitates communication between government, citizens, and other stakeholders through access to data, services, and content.” (Oced,

2019)

According to the United Nations E-Government Survey 2014, e-government is defined as “the use of information and communication technologies and their applications by the government to provide public information and services to people”. This definition expands to include information technology in public administrative processes to streamline them, integrate workflows, manage data, enhance public service delivery, and support communication channels to facilitate public access to and empowerment of services. (Uinted nation, 2014)

Gartner, a provider of business research and advisory services for the IT industry, works with organizations to develop technology strategies, plans, and budgets, as well as select the right technologies for their operations, defines digital government as “a government designed and managed to leverage digital data to improve, transform and create government services.” (world bank group, 2016)

These definitions generally focus on common themes such as using digital technologies, improving government services, enhancing citizen engagement, and creating public value through digital transformation in the public sector.

The key aspects of Digital Government:

1- Effectiveness and efficiency: This refers to the ability of the system to meet the users' goals, ensuring speed and accuracy in completing tasks effectively.
2- Learnability: Ensuring that the technology is easy for users without needing high skills. (Rini Yudesia, Mahmudul, & Ganthan Narayana, 2019)
3- Transparency and Accountability: Digital technologies increase transparency in government processes. Digital platforms enable real-time communication and feedback between citizens and government officials, strengthening accountability and public trust.
4- Citizen participation: Digital government encourages citizen participation through mechanisms such as online consultation and feedback systems. Such participation is critical to ensuring that government policies reflect the needs and views of the public.
5- Holistic approach: Successful digital government requires a coherent strategy that combines digital technologies, participatory practices and innovative policies to create a responsive public management system. (Fabhio, Deka, Sitti, Endah, & Rud, 2024)

Digital governance faces several challenges in the smart era, including:

1- Data protection and security: The widespread collection and use of personal data raises serious concerns about personal privacy protection. It is essential to ensure the security of citizens' personal data during data collection, storage, and processing.
2- Prevention of cybercrime: With the advancement of technology, the threat of cybercrime continues to increase. Digital governments must implement strategies to combat cybercrime and data breaches to ensure national and personal security.
3- Digital divide: The introduction of smart technologies may exacerbate the problem of unequal access to digital information and differences in people's digital skills. Addressing these inequalities is essential to ensuring social inclusion and justice.
4- Slow response to departmental requests: Digital governments often struggle to respond slowly to the needs of different departments, which can hinder effective governance.
5- Data silos: The existence of data silos can hinder the exchange and dissemination of information, limiting the effectiveness of data-driven decision-making.
6- Poor service collaboration: Collaboration between different services can pose challenges, affecting the overall quality and efficiency of public services. (Weihua, 2024)

2.2 The digital economy

The shift to a digital economy is driven by technological developments, changing consumer behaviors, and businesses adapting to new opportunities and challenges in the digital landscape.

The transition from traditional to digital finance represents one of the most significant economic transformations in recent history. These changes have been driven by rapid technological advances, changing consumer behavior and evolving business models.

Here are the most important stages of this transformation:

1- Computerization of Business Processes (1960s-1970s): The introduction of mainframe computers into business marked the beginning of digital transformation. Companies began to automate back-office functions to

increase efficiency and data processing capabilities. (james, 2004)

2- Personal Computing Revolution (1980s): The advent of the personal computing revolution during the 1980s signified a profound transformation in the manner in which individuals engaged with technological advancements, transitioning from the utilization of mainframe computers to the adoption of desktop computers within domestic and professional environments. (Erik & Lorin, 2000)

3- Rise of the Internet and E-commerce (1990s): The decade of the 1990s witnessed a significant proliferation of the Internet and electronic commerce, fundamentally altering the modalities through which enterprises and individuals partake in online transactions. The Internet has fundamentally transformed market dynamics by substantially diminishing the expenses associated with various transaction types, thereby facilitating value generation through enhanced access to information and commodities. E-commerce platforms have emerged as innovative avenues for enterprises to connect with consumers and execute transactions, thereby reconfiguring markets and engendering novel opportunities for entrepreneurial endeavors. The transition towards the electronic orchestration of information via the Internet has been expedited, presenting advantages over conventional methodologies such as Electronic Data Interchange (EDI) with respect to reduced costs, user-friendliness, and adaptability. (Severin & Garth, 2001)

4- Mobile Revolution and social media (2000s): Internet access patterns changed dramatically at the beginning of the 21st century, as mobile devices became ubiquitous These developments in mobile phone technology are viewed as a major breakthrough in the provision of the internet democratized and narrowed the digital divide between developed and developing countries, therefore highlighting the important role of mobile phones for a large segment of users. In summary, the mobile revolution has not only changed the ways users interact with social media but it has also created new opportunities for brands to engage with wider audiences, and demographics than before and not implemented. (Andreas & Michael, 2010)

5- Cloud Computing and Big Data (2010s): In 2010, there was a major convergence between cloud computing infrastructures and big data approaches. Cloud computing platforms have provided the infrastructure

needed to store and process large amounts of data, which is becoming increasingly common across industries This collaborative model has enabled organizations to implement big data analytics without having to spend significant initial capital on hardware of resources

By confronting cloud computing and big data analytics, companies can participate in data-driven decision-making processes. As organizations have implemented sophisticated analytics tools, they have been able to monitor customer behavior, improve operational efficiency, and enhance the customer experience, thus driving innovation and increasing productivity. (James, et al., 2011).

The digital economy also has elements and components, the most important of which are as follows*:*

1- Digital Infrastructure: Digital infrastructure includes the infrastructure technologies and infrastructure that underpin the digital economy. It includes the hardware, software, networks, and services that facilitate digital communication and data exchange. These policies are necessary to enable financial services and to ensure the proper functioning of the various sectors. (OECD, 2020)

2- E-commerce and Digital Platforms: E-commerce platforms and digital marketplaces serve to enable online transactions between companies, consumers, and government agencies. Illustrative examples include:
B2C platforms (e.g., Amazon, Alibaba) B2B platforms (e.g., Alibaba B2B, SAP Ariba) Shared financial systems (e.g., Uber, Airbnb). (geoffrey, marshall, & sangeet, 2016)

3- Digital Financial Services: Digital Financial Services (DFS) involves the broader digitization of finance and includes all electronic financial products and services including credit cards, electronic transaction systems and online banking systems These services tend to focus on basic financial services and they improve their efficiency through implementation advanced technology.
The emergence of digital financial services poses significant challenges to traditional financial service providers, forcing them to develop by competing with or fostering collaboration with fintech's At the heart of these changes is the need to they appeal to a younger tech-savvy population.

Digital financial services also contribute significantly in underdeveloped areas by providing community banking services with easy access to traditional financial systems This can include mobile payment solutions and credit facilities. (Gomber, Koch, & Siering, 2017)

4- Digital Skills and Human Capital: Both the acquisition of digital skills in terms of knowledge and understanding of modern and developed drives organizational competitiveness, which is inevitable for individual and 21st-century skills. communication association for regular teaching and emphasizes the importance of adaptability. This type of communication is critical for individuals not only to develop but to contribute meaningfully to their work situations. (Laar, Deursen, Dijk, & Haan, 2017)
5- Big Data and Analytics: Both the acquisition of digital skills in terms of knowledge and understanding of modern and developed drives the organizational competitiveness, which is inevitable for individual and 21st-century skills. communication association for regular teaching and emphasizes the importance of adaptability. This type of communication is critical for individuals not only to develop but to contribute meaningfully to their work situations. (James, et al., 2011)
6- Digital Government Services: Digital government services involve the collection, execution, and management of a wide range of services related to various government agencies. Governments are rethinking their internal processes to increase planning efficiency and improve public engagement. Their goal is to anticipate users' needs before requesting a service, thereby enhancing a comprehensive user experience. Digital governance capability refers to the competence of government agencies and citizens in planning and implementing the reuse of digital technologies. This requires advanced system-wide capabilities and skills. (UNITED NATIONS, 2020)
7- Cybersecurity and Digital Trust: Cybersecurity plays a key role in ensuring data integrity, privacy, and availability. With the rapid advances in digitalization, the corresponding threat posed by cyber risks increases simultaneously, thus requiring comprehensive measures aimed at protecting digital infrastructure The concept of digital trust is intrinsically linked to consumer protection. Countries are actively seeking to upgrade the effectiveness of data protection measures and

uphold the rights of consumers in the digital environment. This policy includes education on consumer rights and potential risks associated with online activities. Developing digital trust is essential to encourage the adoption of digital technologies. Such trust can be achieved by establishing the principles of transparency, accountability and strong cybersecurity. When individuals and organizations perceive their digital interactions to be secure, they show a greater propensity to use online services and platforms. (OECD, OECD Digital Economy Outlook 2020, 2020)

3. Algeria between the path of adopting a digital government and the need to realize a digital economy.

In a rapidly evolving global environment of digitization, Algeria meets the twin requirements of implementing e-government initiatives and accessing a comprehensive digital economy Co This transition, which implies a major restructuring of the management of communication and administrative tasks, includes initiatives ranging from the implementation of online platforms in administrative processes to the digitization of public documents and e-participation strategies. This far-reaching transformation involves a digital ecosystem that includes e-commerce, digital manufacturing, and the integration of digital technologies into various sectors of the economy The digital economy promises increased productivity, new business prospects, and improved competition in the global market.

3.1 Algeria's Digital Government Transition

The development of digital governance systems in Algeria is gaining momentum, although not without some limitations and potential factors for progress. These developments have a broader international movement towards the implementation of e-government, which seeks to improve the delivery of public services while increasing government transparency and efficiency.

This shift is driven by a number of reasons:

- Rapid technological developments around the world have brought Algeria in line with these international changes, aimed at increasing the competitive position of the domestic firms relative to their counterparts abroad and to governing Algeria handling the burden of public administration Communication with government officials.

- To achieve the highest level of transparency by reducing bureaucratic

barriers by implementing modern technological advances in networks, and this is done by removing many negative factors such as corruption and nepotism. (Aziz, 2024)

- In the context of the evolution towards a digital economy, the pursuit of robust customer relationships is paramount. With the advent of novel information and communication technologies, along with the innovative applications that they engender, the fulfillment of customer needs emerges as a pivotal emphasis, particularly in the context of leveraging the products derived from the digital revolution, which encompass contemporary communication modalities: electronic mail, social networks, and similar platforms, thereby facilitating interactivity and responsiveness. (Rania & Boushama, 2023)

- Enabling simultaneous access to identical documents by multiple individuals, while providing the chance to engage with information in its comprehensive form, inclusive of its origins and various branches.

- The pursuit of enhancements in the efficiency and efficacy of administrative work output is essential for achieving a rational electronic administration that relies on administrative adaptability and the shift from traditional management of physical entities to the management of digital processes. (Aziz, 2024)

Algeria, akin to other nations, endeavored to implement the e-government initiative by inaugurating the e-Algeria project in 2013, as part of a comprehensive program comprising 13 pillars designed to align with the global transformations currently unfolding. To ascertain Algeria's standing in this trajectory, we will utilize the EGDI, an index specifically developed to evaluate the preparedness and capacities of national administrations in employing communications and technology for the delivery of public services. This composite index is founded on the weighted average of three standardized indicators, which include the Telecommunications Infrastructure Index, the Human Capital Index, and the Internet Service Index. (Mourad & Samiya, 2021)

Table 1: Countries leading e-government development in Africa, 2024

Country	Rating class	EGDI rank	Subregion	OSI	HCI	TII	EGDI (2024)	EGDI (2022)
South Africa*	V2	40	Southern Africa	0.8872	0.8026	0.8951	0.8616	0.7357
Mauritius*	V1	76	Eastern Africa	0.5903	0.7456	0.9159	0.7506	0.7201
Tunisia	HV	87	Northern Africa	0.5951	0.6497	0.8357	0.6935	0.6530
Morocco	HV	90	Northern Africa	0.5618	0.6078	0.8827	0.6841	0.5915
Seychelles	H3	92	Eastern Africa	0.4638	0.6769	0.8913	0.6773	0.6793
Egypt	H3	95	Northern Africa	0.7002	0.6150	0.6946	0.6699	0.5895
Ghana	H2	108	Western Africa	0.6084	0.5586	0.7281	0.6317	0.5824
Kenya	H2	109	Eastern Africa	0.7770	0.5271	0.5901	0.6314	0.5589
Cabo Verde	H2	111	Western Africa	0.6892	0.5694	0.6128	0.6238	0.5660
Botswana	H2	112	Southern Africa	0.3985	0.5719	0.8649	0.6118	0.5495
Eswatini	H2	113	Southern Africa	0.4557	0.5836	0.7851	0.6081	0.4498
Namibia	H2	114	Southern Africa	0.4996	0.5738	0.7288	0.6007	0.5322
Algeria	H2	116	Northern Africa	0.3320	0.6418	0.8129	0.5956	0.5611
Rwanda	H2	118	Eastern Africa	0.8207	0.5467	0.3724	0.5799	0.5489
Gabon	H2	121	Middle Africa	0.3187	0.5772	0.8263	0.5741	0.5521
Côte d'Ivoire	H1	124	Western Africa	0.5219	0.4848	0.6693	0.5587	0.5467
Libya	H1	125	Northern Africa	0.0808	0.5951	0.9639	0.5466	0.3375
Zambia	H1	130	Eastern Africa	0.4958	0.6225	0.5088	0.5424	0.5022
Senegal	H1	135	Western Africa	0.4779	0.3380	0.7328	0.5162	0.4479

Source: United Nations, E-Government Surveys, 2024

It is clear from the above table that in 2024, Algeria ranks 116th globally in the EGDI with a score of 0.5956, which was 0.5611 in 2022 and 0.5173 in 2020, which ranked 120th globally, after ranking 130th and 150th in 2016 and 2018.

This confirms the doubling of efforts year after year to develop the foundations of digital government in Algeria, whether by increasing the speed of the Internet and expanding its network, enabling the means of communication by spreading the use of mobile phones and expanding the communication network, as well as investing in the human element and qualifying it to be able to use modern means of communication and innovative applications, all within the sub-indices of the EGDI.

One of the most important indicators that confirm the state's orientation towards digitization is the activation of many electronic services that primarily concern the citizen within a unified portal called e-government and e-administration. This is clearly evident through the digitization of civil status documents that allowed the extraction of birth and death certificates and others via the Internet. These are services resulting from the entry of digitization into the Ministry of Interior and other sectors that were affected by the digitization

process, such as the justice sector through the creation of a special portal for tracking cases and extracting criminal records and citizenship certificates remotely. As for the higher education sector, it raises the slogan of zero paper, to acknowledge the digitization of many administrative and pedagogical works through many platforms.

3.2 The reality of the digital economy in Algeria.

The Algerian economy is undergoing a major transformation, as the country tries to keep up with the global development in the digital sphere. The following are the most important indicators of the Algerian digital economy that ensure this transformation:

1- Digital Infrastructure and Connectivity: Algeria has successfully installed nearly 200,000 kilometers of fiber optic infrastructure by the end of 2021, thereby increasing connectivity in 58 metropolitan areas This technological infrastructure is essential for the high-speed internet and telecommunications services that it is key to facilitating a growing digital economy During the year, Algeria dramatically expanded its international Internet bandwidth to 7.8 Tb/s, a significant increase from 2.8 Tb/s in 2021 and 1.5 Tb /s by 2020. This increase in bandwidth capacity to meet the growing demand for Internet services and the use of digital applications is important. The Algerian government has put in place a number of laws aimed at combating cybercrime and strengthening digital security, which are essential to achieving a secure digital environment. (Oumeddour, 2024)

2- E-commerce: The advent of e-commerce has created a favorable environment for businesses in Algeria, which ends up with higher profitability. The Internet is an important platform for these businesses, allowing them to reach a wider audience and increase their productivity. Due to the growing popularity of e-commerce, the adoption of new digitally compatible payment methods is forcing investors to develop electronic payment options for primary bank cards to facilitate transactions in a market that is starting this: Algerian companies are adapting the e-commerce paradigm. They offer investments in technologies and processes that strengthen e-commerce, thus demonstrating a shift towards a digital economy despite the current challenges and contradictions in countries with advanced e-commerce infrastructure.

3- Structure of companies: The Algerian government announced a number of

initiatives designed to enhance the basic ecosystem, with a particular emphasis on the digital economy These measures represent the acceleration of digital transformation in critical sectors such as finance infrastructure, healthcare, agriculture and education, all of which are key to boosting innovation and effective digitalization. Algeria's economy boomed thanks to the emergence of new digital finance services This growth is very important for start-ups, as it provides the financial tools and services needed to develop the digital economy, which all ended up surpassing 16 billion Algerian dinars This development indicates an improved environment for start-ups involved in digital marketing and financial services. (Soumya, 2023)

Figure 1: Arab countries' performance in the Arab digital economy index 2024

Source: Arab Federation for Digital Economy, report 2024.

The Arab Digital Economy Index is designed to provide key insights and recommendations for policymakers in the Arab region to achieve the goals of sustainable digital economic growth, consisting of five strategic dimensions and nine key pillars.

The strategic dimensions are Digital Foundations, Innovation, E-Government, Digital Business, and Digital Citizen.

The core pillars are Technology Readiness, Infrastructure, Institutions, Innovation, E-Government, Workforce, Sustainable Development Goals, Financial Market Growth and Market Development.

According to the index, Arab countries are divided into three categories: digital growth leaders, active digital transformation leaders, and development seekers.

Algeria is also included in the group of countries active in digital transformation, which includes Jordan, Tunisia, Morocco, Egypt and Lebanon.

This indicates a continuous work to develop the strategic dimensions of the index, by providing digital foundations, encouraging innovation in the digital field, supporting the work of e-government with texts and regulatory laws and working to reach the digital citizen.

4. The role of the e-government in promoting e-economy in Algeria:

The relationship between e-governance and e-economy is complex and interdependent, and both paradigms play an important role in the digital transformation of government services and investment processes Their relationship is examined below:

1- There is a negative relationship between e-government and corruption. As the provision of e-government services increases, the prevalence of corruption decreases. e-government plays an important role in reducing administrative corruption by improving the quality, efficiency, equity and transparency of public services in both time and space The aspects of e-government in Algeria remain very low However, progress has been made slowly in recent years. This model suggests that the government will embark on measures to expand electronic services, which can help address the shadow economy in the long term By increasing transparency and reducing corruption in government services and practices also reduces inquiries as well, helps to streamline financial efficiency E-government facilitates efficiency and management of projects, and makes it more difficult for informal financial activities will bury legislators. (Nesrine, 2022)

2- Digital Identity, which was initiated in Algeria in 2016, has facilitated financial institutions in their endeavors to interact with customers while adhering to anti-money laundering protocols and various "know your customer" mandates. Furthermore, advancements in Open API technology have permitted Digital Financial Services (DFS) providers to obtain data from diverse public and private systems, thereby enhancing the efficiency and reducing the expenditure associated with financial services, all without jeopardizing safety and regulatory compliance.

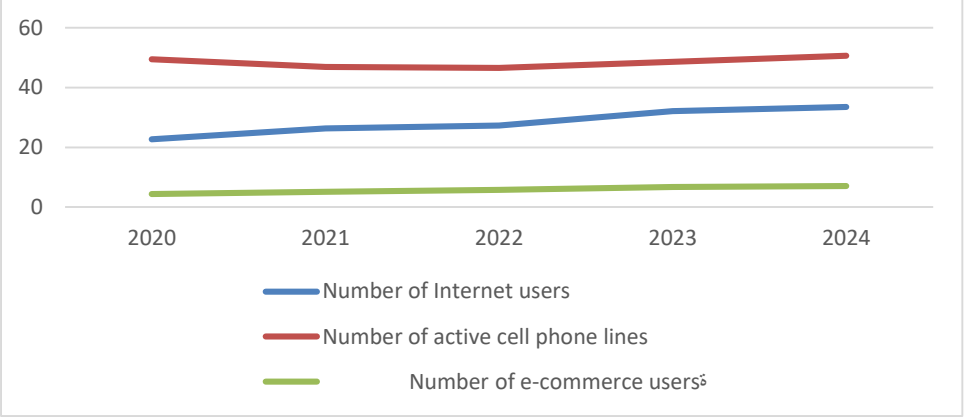
3- The emergence of substantial e-commerce platforms is becoming increasingly significant, exemplified by Jumia’s recent entry into the

Algerian market to complement existing local platforms such as OuedKniss, Batolis, and IdealForme. Telecommunications operators, which are considered a critical focus of e-government initiatives, have reaped advantages from the capabilities of digital financial services that streamline payment processes and provide pay-as-you-go options for solar energy, insurance, and loan products.

4- While numerous nations have initiated efforts to tackle the fundamental facilitators essential for the governance of digital financial services and digital payments, which are underpinned by e-governance, specifically, conducive legal and regulatory frameworks, supportive financial and digital infrastructure, and empowering governmental support systems: Conducive legal and regulatory frameworks, supportive financial and digital infrastructure, and empowering governmental support systems.

Addressing these three domains necessitates that policymakers contemplate a broad spectrum of pivotal concerns, ranging from fundamental digital connectivity and mobile penetration to access to national payment infrastructures and electronic money, as well as non-bank services or the implementation of digital and biometric identity systems, thereby facilitating access to governmental data platforms and ensuring competition in the realm of digital financial services. (Dorothee & Isabelle , 2021)

Figure 2: Evolution of the number of Internet, mobile, and e-commerce users in Algeria 2020-2024 (Unit: Million)



Source: Prepared by the researcher based on statistics of statista and the international trade administration

From Figure 2, it can be seen that
The number of internet users remains relatively stable, with a slight increase over the years.
I am starting from 22.71 million in 2020, and reaching 33.49 million by 2024.
Active cell phone lines (red line):
The trend shows a slight decrease at first, dropping from 49.48 million in 2020 to 46.57 million in 2022.
A slight recovery is then observed, reaching 50.65 million by 2024.
In terms of e-commerce users (green line):
There is a steady increase in e-commerce users throughout the period.
Starting at 4.43 million in 2020, it grows consistently yearly, reaching 7.03 million by 2024.
Analysis:
Internet usage: Stability and a slight increase indicate a mature market with limited but steady growth potential.
Cell phone lines: An initial decline followed by a rebound may indicate market saturation or shifts in technology usage patterns.
E-commerce growth: The continued rise in the number of e-commerce users highlights increasing digital adoption and consumer confidence in online shopping.
The data reflects a stable digital environment with growth opportunities primarily in e-commerce.
The relationship between the digital environment, represented by the number of internet users and the number of active cell phone lines guaranteed by the digital government, and the digital economy, represented here by the number of e-commerce users, is reflected in the number of e-commerce users.
We can say that the relationship between the two is reciprocal and that whenever the digital government in Algeria develops the digital environment in general, the digital economy develops accordingly because it greatly exploits this environment and relies heavily on it for economic activity.

5. CONCLUSION

Digital government uses technology to modernize public services and increase efficiency.

The digital economy is driven by technological advances, changing consumer behaviors, and new business models.

Algeria launched the e-Algeria project in 2013 to implement e-government

initiatives.

It ranks 116th globally in the E-Government Development Index (EGDI) as of 2024, demonstrating its improvement in recent years.

The country has made progress in digitizing civil services, justice sector operations, and higher education administration.

Algeria has expanded its digital infrastructure, installing 200,000 kilometers of fiber optic cables by 2021.

E-commerce is growing, with the emergence of new platforms and the development of e-payment options.

The country is focusing on digital transformation in key sectors such as finance, healthcare, and education.

E-government initiatives help reduce corruption and improve transparency.

Digital identity systems implemented in 2016 have facilitated financial services.

E-commerce platforms are also expanding, capitalizing on improved digital infrastructure.

We conclude that there is a relationship between digital government initiatives and the growth of Algeria's digital economy, with improvements in the digital environment supporting digital economic development.

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