

**Government portal for public services as a mechanism
to promote digital government in Algeria****NEZALI Samia ^{1♦}, AMROUCHE Cherif ²**¹ University of Blida 2 Lounici Ali (Algeria), s.nezali@univ-blida2.dz² University of Blida 2 Lounici Ali (Algeria), c.amrouche@univ-blida2.dz**Received:** 21/09/2025**Accepted:** 11/11/2025**Published:** 25/11/2025**Abstract:**

The objective of this study is to illuminate the role of digital public services provided through the Algerian governmental portal for public services, "Bawabatic", in enhancing the e-Government Development Index (EDGI). A descriptive and analytical approach was employed to examine the key stages of digital government and the factors contributing to its success, as well as the digital and legislative infrastructure in Algeria that underpins the digital government.

The study revealed that the governmental portal for public services serves as a model for inter-sectoral connectivity in Algeria. The platform is characterised by its openness, which facilitates interaction between stakeholders and diverse public administrations. It also provides services based on specific data for each entity, whether natural or legal

Keywords: Government Portal, Digital Public Services, Digital Government, EDGI.**JEL Classification:** O 33, O 36, L 86.

♦ Corresponding author

1. Introduction:

Digital development has become prevalent in all sectors and fields across the world, and digital services have become an imperative for governments to effectively serve individuals, businesses and society in order to meet their diverse needs. For this reason, countries are investing in digital infrastructure and providing large-scale digital government systems and initiatives, which now account for a significant proportion of public sector investment and operations. Digital transformation is not limited to technical tools, but also includes a change in the way of thinking, working and interacting within institutions and societies.

One aspect of digital development is the launch of digital government services through electronic portals to provide services to citizens, such as digital identity, electronic payment, and smart licences.

Digital development is the primary catalyst for e-government advancement, with e-government itself being regarded as one of the most pragmatic and prominent manifestations of this evolution. As with other countries worldwide, Algeria adopted e-government several years ago. In its nascent stages, the initiative encountered substantial challenges, including a paucity of adequate infrastructure, protracted project completion, inadequate funding, and other issues that impeded the attainment of elevated e-government indicators. However, in recent years, Algeria has made significant strides in enhancing the quality of services delivered through digital technology, thereby facilitating enhanced citizen engagement with the administration without the need for physical travel. The government portal for public services is one of the platforms that has facilitated access to public services in Algeria.

1.1. Research Problem:

In view of the aforementioned points, the following research question is hereby proposed:

What mechanism is adopted through the government portal for public services to promote digital government in Algeria?

1.2. Sub-questions:

The following sub-questions can be posed to elaborate on the aforementioned research question:

- What are the stages of development of digital government and what are the indicators for measuring its effectiveness?
- What are the digital and legislative pillars on which Algeria has based its move towards digitizing its public services?
- Does the government portal for public services contribute to improving the EDGI index?

1.3. Hypothesis:

Through the study's problem statement and sub-questions, the following study hypotheses were proposed:

- Government services have evolved from closed processes to an open approach, where their effectiveness is measured by several indicators and based on numerous components.
- Algeria has enacted legislation and established digital foundations to facilitate the digitisation of government services.

- The government portal for public services contributes to improving the EDGI index.

1.4. Study structure:

To answer the study's problem and sub-questions, the study was divided into two main axes. The first theme concerns the basic concepts of digital government, while the second theme concerns the presentation of the government portal for public services, 'Bawabatic,' and the indicators of digital government in Algeria.

2. Basic Concepts of Digital Government:

2.1 The concept of Digital Government:

The term "Digital Government" refers to the utilisation of digital technologies as an integral component of government strategies. The strategy is predicated on the leveraging of a nation's digital ecosystem for the purpose of engaging government actors, non-governmental organisations, businesses, civil society and individuals to support the production of and access to data, services and content through interaction with the government. Digital government can be categorised into three distinct systems: those employed for the management of internal systems and processes; the delivery of government services; and the interaction with stakeholders. (USAID, 2022, p. 3). It is also defined as the use of digital technologies as an integral part of government modernisation strategies to create public value. It is designed and implemented to leverage digital data and technology to create, optimise and transform public services. This represents a significant advancement from traditional analogue procedures and systems, reflecting the maturing adoption of modern technologies within the public sector. (Draft Digital Government Policy Framework, 2024, p. 6)

Taking both of the above definitions into account, digital government can be defined as the strategic use of digital technologies to modernise public sector operations, create public value and improve interaction with stakeholders. This involves using digital ecosystems to transform internal processes, deliver services efficiently and encourage data-driven engagement throughout the sectors of government and society.

The advent of new Internet technology signified a convergence of technologies hitherto regarded as discrete entities, encompassing information and communications technology and broadcasting, giving rise to novel forms of information and communications technology. This technological convergence, which entailed the convergence of content, infrastructure, and the storage and processing capabilities of computers and consumer electronics, was precipitated by the following technological trends occurring in parallel: (Lips, 2020, p. 25)

- Digitisation: the conversion of analogue data into a digital format, and the growing use of digital technology in networks, products, and services.
- Convergence: Digitisation enables the convergence of networks, products and services. This leads to a situation where any type of carrier is capable of delivering any type of service to any type of device. Consequently, text, voice, images, video and data can be combined within the same product or service.
- Interactivity: Digitisation enables active user participation, with interactive service outputs resulting from user inputs. Consequently, users can determine when to consume interactive services.

- Increased computing power creates new, innovative opportunities for service delivery to consumers.

The digital government's investments are intended to achieve the following: (USAID, 2022, p. 6)

- Coordination: providing the necessary systems and tools for government agencies to collaborate across ministries and levels (e.g. national, regional and municipal).

- Efficiency: by reducing the time spent on administration and enabling innovation and financial savings.

- Resilience: supporting responses to and recoveries from natural disasters or other sudden socio-economic changes.

- Responsiveness: Increasing the ability to anticipate and respond to a range of stakeholder needs, including those of individuals, the private sector and civil society actors.

- Accountability: By reducing opportunities for corruption and providing the necessary tools to design collaborative, inclusive, accessible and transparent policies and services.

- Participation: Creating systems and tools that enable citizens and civil society to engage with governments.

2.2 Stages of Digital Government Development:

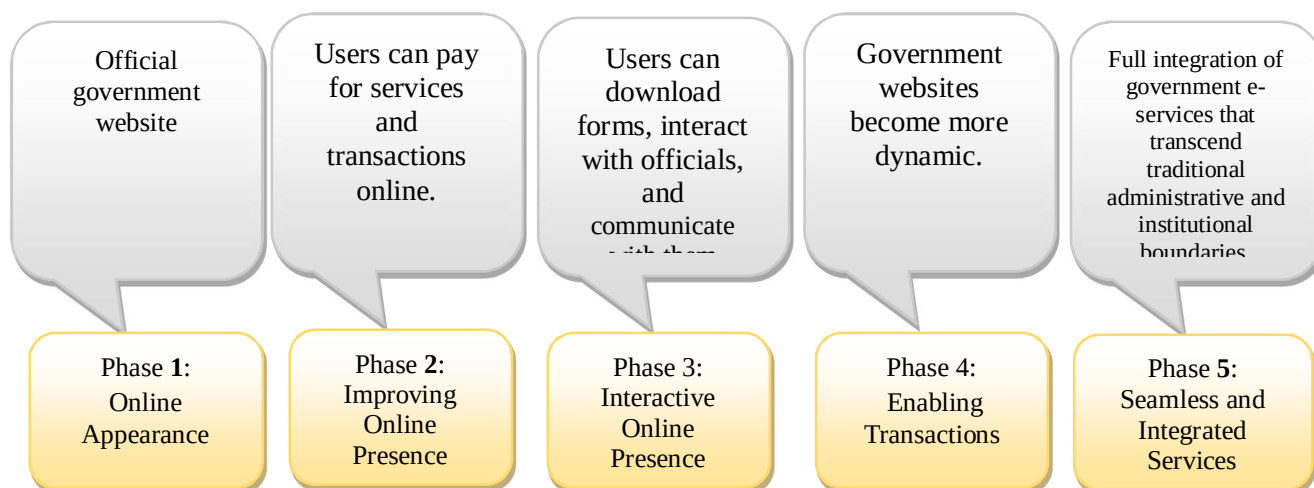
The transition from e-government to digital government occurred when priority was given to the utilisation of digital tools and data in internal operations and the provision of public services that meet user needs. This encompasses the adoption of an open, data-driven, and risk-managed approach that engages stakeholders throughout the entire process. The subsequent figure illustrates the developmental phases of government public services, accompanied by a delineation of the characteristics that are indicative of each stage.

Figure 1: Digital transformation of public services



Source: OECD, The E-Leaders Handbook on the Governance of Digital Government, OECD Digital Government Studies, Paris, 2022, P 22.

The United Nations has developed a model for the evolution of digital government consisting of five stages, ranging from the simplest stage, which is the government's presence on the Internet through an official website, to the most complex stage, which is the full integration of e-government services. It is evident that the majority of countries are currently in the second or third stage.

Figure 2: UN Model of Digital Government Development Stages

Source : Ali Mohammed Al-Khour, Digital Government: ‘Circle of Interest,’ Arab Administrative Development, League of Arab States, Egypt, (2020), p. 23.

The following steps summarise the process of providing services of digital government: (Al-Khour, 2021, p 42)

- **Service innovation:** This stage is driven by user needs and desires, where government institutions identify the need for a particular service and develop it to meet specific requirements and serve all target groups.
- **Service delivery:** During this stage, government institutions make the service available to target groups. They take into account the groups' characteristics and capabilities, as well as the factors influencing their decisions and preferences regarding the most appropriate channels for service delivery. To ensure the participation of all segments of society, attention is paid to the inclusiveness of services.
- **Access to the service:** The main objective of the innovative service is to enable access and use by target users. The method of verifying users' identities on digital platforms should be determined during this stage.
- **Ability to collect and analyse service data:** During this stage, reports are prepared and used to develop and improve the service system as a whole. Problems arising between service providers and users are also resolved during this stage, as are evidence requirements to verify the validity and legality of complaints.

If the digital government services process is implemented well, it has the potential to reduce administrative bureaucracy, improve service delivery, and increase public trust.

2.3 Measuring the effectiveness of digital government:

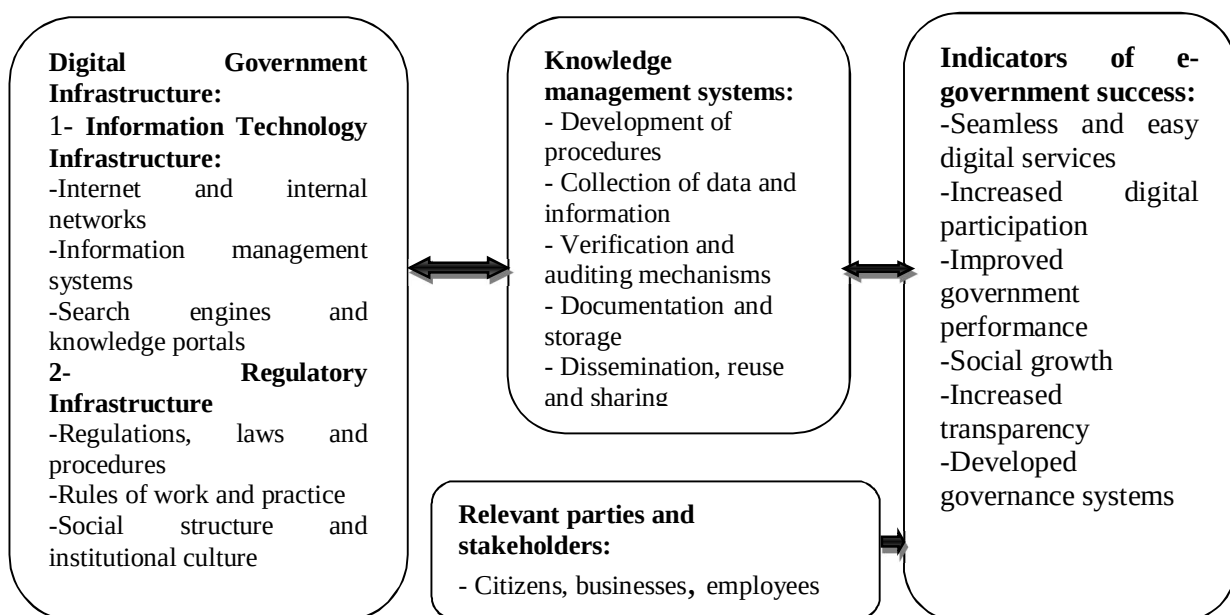
In order to measure the effectiveness of government in adopting information and communications technology and achieving its digital goals, seven measures have been proposed, which we summarise below: (Maniam, 2020)

- Success of digital projects: Measured by the number of cancelled projects, taking into account factors such as project size, leadership support, and IT expertise.

- Price competitiveness of government digital projects: Assesses the cost of government projects to similar efforts in other governments and sectors, taking into account contract and tender audits and market prices.
- Relative effectiveness of government IT systems: measured by the quality and efficiency of technology systems, with a focus on their effectiveness in delivering desired outcomes;
- Use of government digital platforms: measured by citizens' use of digital systems, including their ease of use and usefulness in delivering services;
- Government data security: assesses the level of cybersecurity for protecting government data, including the protocols and technologies used, such as encryption and multi-factor authentication;
- Timeliness of government IT project completion: Measures the ability of governments to complete digital projects within a reasonable timeframe, based on project size and experience in predicting obstacles;
- Use of data in policy formulation: This includes how digital data is used to analyse patterns and develop regulatory strategies, such as improving tax collection and analysing data across government systems.

The success of digital government is linked to several dimensions related to infrastructure, knowledge management systems and stakeholders, as illustrated in the figure below:

Figure 3: Components of digital government success



Source: prepared by researchers based on: Ali Mohammed Al-Khouri, Digital Government: 'Circle of Interest,' Arab Administrative Development, League of Arab States, Egypt, 2020, p. 77.

The government's role is to provide basic services, including digital services, to all people within a given country, regardless of their legal status or rights. This includes residents, visitors, immigrants and refugees, as well as citizens.

The success and effectiveness of digital initiatives is influenced by people's participation and

support, particularly through e-participation mechanisms such as e-information, e-consultation and e-decision-making, which contribute to shaping digital development in any country.

Digital services are becoming increasingly important in supporting businesses, particularly small and medium-sized enterprises, in the growing digital economy. Consequently, governments are providing online platforms to facilitate procedures such as registration, licensing and tax returns, thereby reducing bureaucracy and improving the business environment. As the digital economy is expected to account for 25% of the global economy by 2025, businesses are increasingly demanding digital support from governments. Success in this area requires coordination between governments and businesses to develop new digital business models while encouraging innovation and participation in formulating national digital policies.

E-government development focuses on strengthening the capabilities of public servants. Digital transformation in the public sector requires digital interactions and data sharing between government institutions, for which advanced skills and competencies are needed. These skills include not only technologies such as cloud computing and artificial intelligence, but also data literacy, digital literacy and the ability to adapt to continuous development. (United Nations, 2024, pp 20-22)

3. The 'Bawabatic' platform and Algeria's digital government indicators:

3.1 The development of digital infrastructure in Algeria:

Algeria has one of the largest internet markets in Africa. In 2022, it ranked sixth in Africa for the number of internet users, with around 27 million people online, meaning more than 60 per cent of the population was connected. Algeria was also ranked among the most inclusive African countries in terms of internet access, with high levels of availability and affordability. (statista, 2024)

Table 1: Evolution of internet usage indicators (2021–2024).

	2021	2022	2023	2024
Number of internet users (million)	26.35	27.28	32.09	33.49
Internet penetration rate (% of total population)	59.6	60.6	70.9	72.9
Change in percentage of internet users (%)	16	7.3	1.8	3.9
Fixed internet connection speed (Mbps/ second)	-	11.44	11.01	12.32
Internet connection speed (mobile phone) (Mbps/ second)	-	9.78	13.40	21.36

Source: Prepared by researchers based on: Digital in Algeria, https://datareportal.com/digital-in-algeria?utm_source=DataReportal&utm_medium=Country_Article_Hyperlink&utm_campaign=Digital_2024&utm_term=Algeria&utm_content=Country_Page_Link

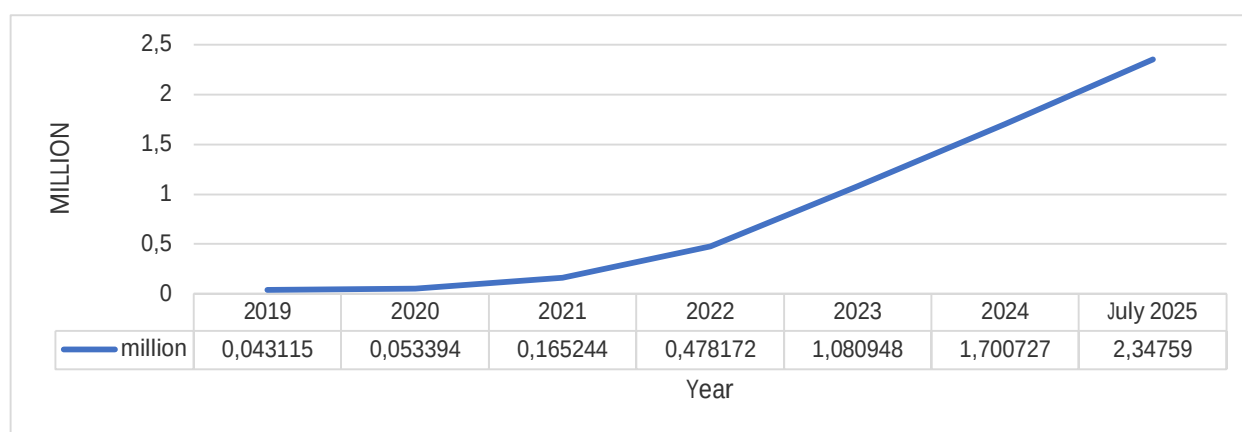
At the beginning of 2022, the average mobile internet connection speed in Algeria increased by 3.58 Mbps (+45.5 per cent) compared to the beginning of 2021. During the same period, the average fixed internet connection speed increased by 6.16 Mbps (+170%). (Digital 2024: Algeria, 2024)

In accordance with Article 29 of Law No. 18-04, which establishes the general principles

governing postal and electronic communications, national electronic communications networks have been developed and utilised to enhance fixed internet access rates. This has been achieved by expanding the number of households connected to the network and by enhancing the efficiency and modernisation of the access network, with a focus on prioritising Fiber optic networks and technology for home connections. The aim is to improve the quality of services provided to citizens. In this regard, the number of fixed telephone subscribers increased from 3.5 million households at the beginning of 2020 to 6.6 million in the first half of 2025, thus achieving the set milestones. (Widespread access to Fixed Internet, 2025)

In terms of promoting the use of fibre-to-the-home (FTTH) technology, the number of households connected to fibre optics increased from 53394 in 2020 to 2.35 million in July 2025. Algeria is the second African country, after South Africa, to exceed one million subscribers to this technology.

Figure 4: Evolution of the number of FTTH subscriptions



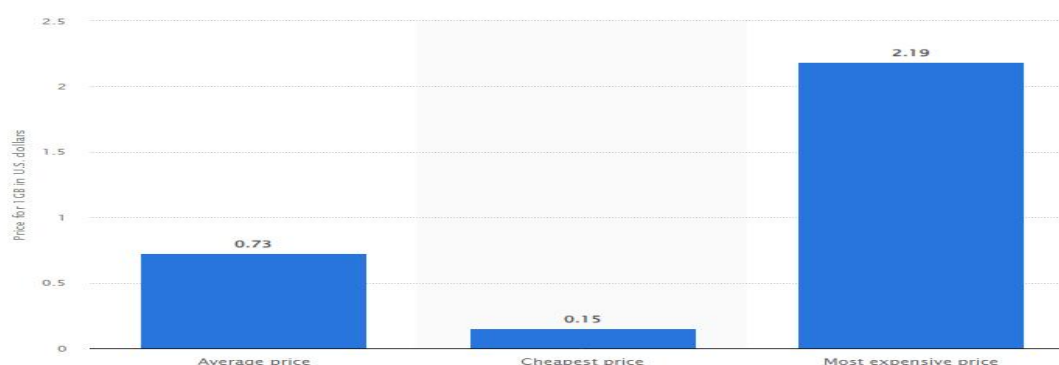
Source: Prepared by researchers based on: Widespread access to Fixed Internet,

<https://www.mpt.gov.dz/genaralization-of-access-to-fixed-internet/>

As for internet prices, the average cost per gigabyte of mobile data in Algeria was US\$0.73 in 2023. Prices range from a minimum of US\$0.15 to a maximum of US\$2.19 per gigabyte. Algeria has one of the lowest mobile data prices in Africa.

Figure 5: Internet prices in Algeria for 2023

Unit:Dollar/Gigabyte



Source: Price for one gigabyte (1GB) of mobile data in Algeria as of 2023(in U.S. dollars per gigabyte),

<https://www.statista.com/statistics/1272989/price-for-mobile-data-in-algeria/>

3.2 The legislative framework for digital transformation in Algeria:

In order to enable Algerian public authorities to implement digital transformation measures in an organised and legal manner that guarantees the protection of shared interests, Algeria has enacted a series of laws and established several authorities and agencies, some of which are summarised below:

- Establishment of the National Agency for the Prevention and Combating of Crimes Related to Information and Communication Technologies: This agency has a dual role: a preventive role with regard to terrorism, subversive activities and crimes related to national security, and a role with regard to other crimes related to information and communication technologies, in addition to supporting the judicial authorities after a crime has been committed. This is provided for in Law No. 09-04. The national electronic authentication and signature systems aim to achieve international recognition and ensure the security of digital services and their compatibility with other recognised bodies around the world. (Hamidani & Hamidani , 2024, p. 22)

- Establishment of a national authority for the protection of personal data, responsible for ensuring that the processing of personal data complies with the provisions of Law 18-07 and that the use of information and communication technologies does not pose any threat to the rights of individuals, public freedoms and private life. (Article 25, Law No. 18-07, 2018, p. 17) This law came into force on 10 August 2023 and, according to Article 4, its provisions apply to all public and private bodies involved in the processing of personal data;

- Establishment of three electronic certification authorities under Law No. 15-04 of 11 Rabi' al-Thani 1436, corresponding to 1 February 2015, which began their work in March 2021: A national authority responsible for supervision and management; A government authority responsible for providing electronic certification services to the government, state institutions and public administration; and an economic authority responsible for economic institutions. Electronic certification is used to guarantee the identity of the parties involved in an electronic transaction and to ensure that data is not altered during transmission;

- Establishment of a postal and digital communications regulatory authority responsible for ensuring the regulation of the postal and electronic communications market;

- Launch of mobile electronic payments using QR codes in August 2020;

- The Algerian legislature enacted Law No. 18-05 to regulate e-commerce in Algeria, establishing a legal framework for e-government activities and creating legal authorities and bodies. (ESCWA, 16 December 2021, p. 3)

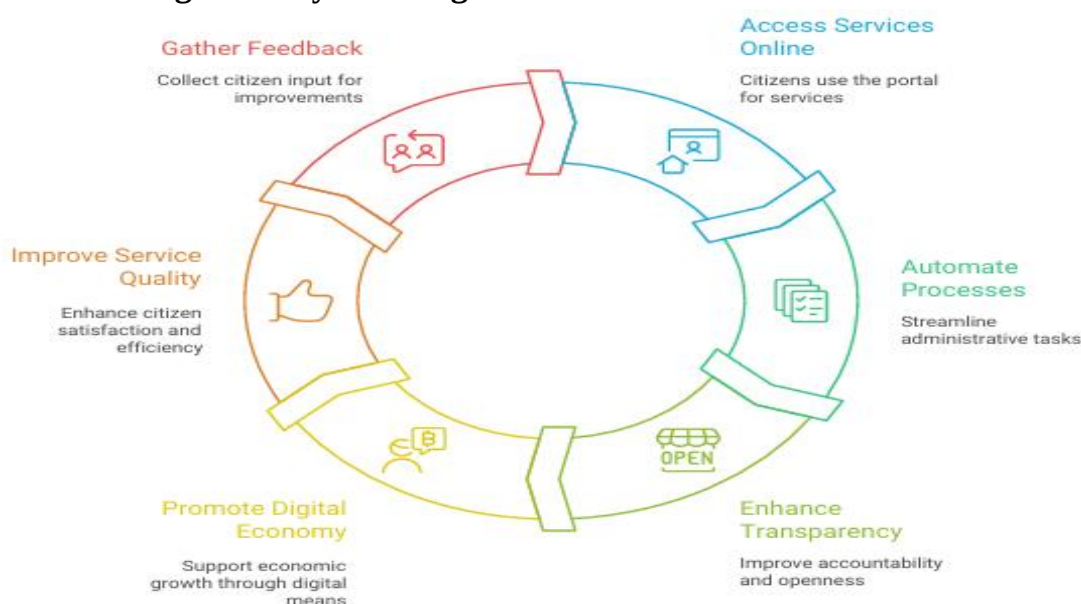
3.3 The government portal for public services and its impact on the EDGI index:

The government portal for public services was launched by the Ministry of Digitalisation on 7 November 2022 as part of the national digital transformation strategy. The portal currently offers 433 digital public services and administrative procedures, available in three languages (Arabic, English and French), allowing citizens instant, round-the-clock access to all digital public services provided by ministries. (Hamidani & Hamidani , 2024, p. 23) This achievement represents a quantum leap in how citizens, customers and associations interact with 21 services provided by category and 25 services provided by sector, providing them with detailed information on all procedures, public services and electronic and non-

electronic government information.

This portal aims to facilitate access to public services and save time and effort by reducing the need to visit government offices in person. It offers a wide range of services such as applying for licences, forms and certificates; university enrolment and registration for final exams; remote bill payment; e-tickets; a space for raising concerns and submitting suggestions for improving services; and other services. This portal contributes to enhancing transparency and improving administrative efficiency by automating processes and providing a unified database of information. It also supports the digital transformation of society and contributes to the promotion of the digital economy, thereby helping to achieve sustainable development and provide high-quality services to citizens. To reduce the distance between the government and citizens, citizens have been enabled to obtain answers and services directly through their email.

Figure 6: Cycle of Digital Public Service Enhancement



Source: Prepared by researchers based on information from the government portal for public services <https://bawabatic.dz/>

The Network Readiness Index (NRI) is one of the world's leading indicators of the application and impact of information and communication technology (ICT) in different economies. In 2023, Algeria ranked 23rd among low-middle income countries in terms of performance, achieving a score above the income group average in the People pillar.

Table 2: Network Readiness Index performance for 2023

Dimension	Algeria	Lower middle-income countries	Arab States
NRI	37.52	38.41	46.59
Technology	31.45	32.12	41.17
People	35.63	34.38	42.66
Governance	41.18	43.27	53.45
Impact	41.82	43.89	49.08

Source: Network Readiness Index 2023, ALGERIA, p 3,
<https://download.networkreadinessindex.org/reports/countries/2023/algeria.pdf>

However, despite the satisfactory results achieved, Algeria lags behind other Maghreb countries, as can be seen in the following table:

Table 3: The Maghreb countries' Digital Government Index (2024).

Country	Ranking EDGI	OSI	HCI	TII	EDGI (2024)	EDGI (2022)
Algeria	116	0.3320	0.6418	0.8129	0.5956	0.5611
Tunisia	87	0.5951	0.6497	0.8357	0.6935	0.6530
Morocco	90	0.5618	0.6078	0.8827	0.6841	0.5915
Egypt	95	0.7002	0.6150	0.6946	0.6699	0.5895
Libya	125	0.0808	0.5951	0.9639	0.5466	0.3375

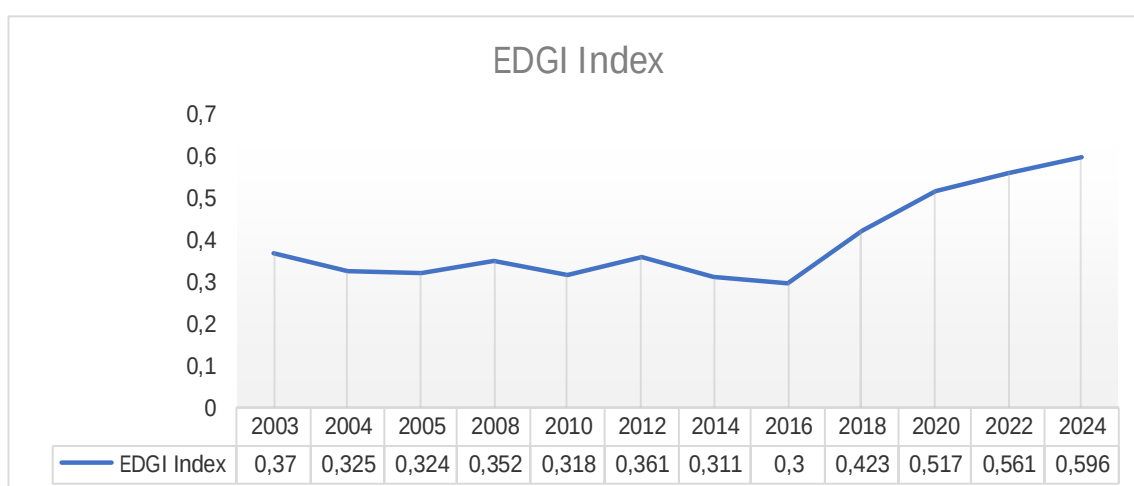
Source: Prepared by researchers based on: United Nations E-Government Survey 2024, (2024), accelerating digital transformation for sustainable development, United Nations, New York, P 96.

The development of remote digital services enables citizens to conduct transactions online. In addition to remote licensing services, some departments have been completely digitised, and invoice management, customs, education and training systems, and some legal applications, such as the electronic legal register, have been digitised. This enables government agencies to create a huge data set.

Digitisation has reduced personal preferences and increased transparency in government transactions. It has also reduced the burden on regulatory staff, improving the performance of public administrations and reducing non-transparent practices.

Digitisation helps to automate certain functions, such as the collection of legal and administrative data, thereby improving performance and facilitating employees' work.

Figure 7: Evolution of the EDGI index in Algeria for the period 2003-2024



Source: Prepared by researchers based on: UN E-Government Knowledgebase, <https://publicadministration.un.org/egovkb/en-us/Data/Country-Information/id/3-Algeria>

Although Algeria is experiencing significant growth in the adoption of digital services,

there are still some obstacles that require attention and resolution. These include:

- **Inadequate infrastructure and connectivity:** Many Algerians, particularly those living in rural areas, have limited access to reliable internet and telecommunications facilities. This hinders their ability to take advantage of digital services.
- **Resistance to change:** Some government officials and employees may be reluctant to embrace e-government, as it may necessitate changes to their established work methodologies.
- **Inadequate coordination:** There is a lack of cooperation between different government agencies, which makes it difficult to implement e-government initiatives smoothly and effectively. (Bouguetiaia & mezouri, 2024, p. 270)
- **Digital illiteracy:** In the current digital age, everyone needs a certain level of digital literacy to reduce digital skill gaps, so digital illiteracy poses a challenge to the implementation of comprehensive digital government, especially in vulnerable and marginalised communities. (United Nations, 2024, p. 24) In Algeria, a large proportion of the population lacks the necessary skills and knowledge to benefit fully from e-services.

4. Conclusion:

In today's world, digital government is essential for achieving sustainable development goals. Given the importance of aligning the interests of public administration with the needs of citizens, Algeria has moved forward with the digitisation and modernisation of its public administrations by creating a platform called the 'Government Portal for Public Services', representing a qualitative shift in service provision.

Through our study, we have reached the following conclusions:

- The portal improves the quality of life for citizens by facilitating interaction with government institutions. People generally prefer easy access to information and digital services, and to complete all transactions online through a single, integrated system instead of submitting multiple requests and interacting with multiple agencies. This has been achieved through the Government Portal for Public Services, where separate digital channels have been integrated into a multi-channel platform to simplify service delivery.
- The government portal for public services enhances transparency and improves administrative efficiency by automating processes and providing a unified database for information. It also supports the digital transformation of society.
- Despite the remarkable progress made in the government's interaction with citizens through digital services, it still lags behind other Arab countries, particularly Maghreb countries.
- Upon examination, the government portal for public services reveals that many services have not yet been finalised, suggesting that coordination between different public administrations is inadequate and that the necessary data is difficult to obtain.
- According to the United Nations' model for the development of digital government, Algeria has entered its third stage. At this stage, citizens can interact with

administrative departments using open data and email, and download forms and submit various requests.

- Algeria has established a legislative framework to regulate the use of modern digital means to ensure the protection of the rights and privacy of all parties.
- Human resources may resist digital change due to a fear that their traditional services may be abandoned, particularly if the change is not accompanied by digital skills training.
- Algeria is seeking to continuously improve its digital infrastructure as an urgent investment in the current climate.

Recommendations:

Based on our study and findings, we can offer a number of recommendations:

- The fast-paced digital age requires the development and promotion of digital literacy. This can be achieved through the establishment of training programmes for both peers and different generations. This is because access to technology and affordability are closely linked to digital literacy. Therefore, it is necessary to improve digital competence and prevent individuals from becoming digitally isolated due to a lack of understanding of how to benefit from digital communications.
- The need to support unified administrative procedures by increasing coordination and exchanging information and data.
- Working to employ artificial intelligence tools to facilitate data collection and analysis, and to fully support the digitisation of public services.
- The need to encourage innovation in the development of software, systems, and cybersecurity for use in the digitisation of public services.
- Continue to strengthen telecommunications infrastructure and fully digitise public services.
- Improve the legislative environment, particularly with regard to modern technologies such as artificial intelligence, cloud computing, open data licensing and digital identity.
- The government should adopt a strategy for developing the digital skills of its workforce, treating them as future managers and monitors rather than abandoning them in favour of artificial intelligence.

5. References:

1. Ali Mohammed Al-Khouri, Digital Government: Concepts and Practices, Arab Administrative Development Organisation, League of Arab States, Egypt, 2021.
2. Ali Mohammed Al-Khouri, Digital Government: 'Circle of Interest,' Arab Administrative Development, League of Arab States, Egypt, 2020.
3. Draft Digital Government Policy Framework, department: Public service and administration (DPSA), South Africa, May 2024.
4. Miriam Lips, Digital Government: Managing Public Sector Reform in the Digital Era, Routledge, Taylor & Francis group, Oxford, 2020.
5. OECD, The E-Leaders Handbook on the Governance of Digital Government, Digital Government Studies, OECD, Publishing, Paris, 2021.
6. Prospects for Digital Transformation in Algeria, 9th Virtual Meeting of Arab E-Government Programme Managers, ESCWA, 16 December 2021.
7. United Nations E-Government Survey 2024, accelerating digital transformation for sustainable development, United Nations, New York, 2024.
8. Hamidani Nadir, Hamidani Ali, Modernizing public service in Algeria within the framework of digital transformation, Social Empowerment Journal, University Amar Telidji of Laghouat-Algeria, Vol 06, Issue 03, September 2024.
9. Soufyane Bouguetaia , Ettayib mezouri, E-Governance in the public sector in Algeria: challenges and progress, Journal of Contemporary Issues in Business and Government Vol. 30, No. 01, 2024.
10. Official Gazette of the Algerian Republic, Issue No. 34, Article 25, Law No. 18-07 dated 10 June 2018.
11. Aaron Maniam, How can we measure and rank digital government successes?, Aug 11, 2020, <https://govinsider.asia/intl-en/article/what-digital-gov-success-looks-like>
12. Digital Government Model, USAID, 2022, https://www.usaid.gov/sites/default/files/2022-12/USAID_Digital_Government_Model_1.pdf.
13. Digital 2024: Algeria, 23 February 2024, <https://datareportal.com/reports/digital-2024-algeria>
14. Internet usage in Algeria - statistics & facts, Jul 8, 2024, <https://www.statista.com/topics/10163/internet-usage-in-algeria/#topicOverview>
15. Government portal for public services, <https://bawabatic.dz/>
16. Network Readiness Index 2023, ALGERIA, <https://download.networkreadinessindex.org/reports/countries/2023/algeria.pdf>
17. Price for one gigabyte (1GB) of mobile data in Algeria as of 2023(in U.S. dollars per gigabyte), <https://www.statista.com/statistics/1272989/price-for-mobile-data-in-algeria/>
18. UN E-Government Knowledgebase, <https://publicadministration.un.org/egovkb/en-us/Data/Country-Information/id/3-Algeria>
19. Widespread access to Fixed Internet, <https://www.mpt.gov.dz/genaralization-of-access-to-fixed-internet/>