

Electronic Public Services: An Analysis of Regional Disparities Using the Online Services Index (OSI)

*Safia Derrouiche**

*Mohamed Seddik Ben Yahia University
of Jijel, (Algeria)*

Derrouiche.safia@univ-jijel.dz

Abdelhafid Meskine

*Mohamed Lakhdar University of Batna,
(Algeria)*

abdelhafid.meskine@univ-batna.dz

Abstract;

This research paper aims to examine electronic public services and analyse regional disparities using the Online Services Index (OSI) and its sub-indices by identifying patterns of inequality across the world's different regions and explaining their determining factors. The study adopted a descriptive and analytical approach based on data from the 2024 United Nations E-Government Survey and employed regional comparison to analyse levels of government digital performance. The findings reveal clear regional disparities in the development of electronic public services, with some regions recording advanced levels, while others continue to experience relative delays in this area. The analysis also indicates that these disparities are associated with several factors, most notably the institutional framework, technological infrastructure, human capital, the availability of digital content, and the quality of electronic services. The study concludes that improving the performance of electronic public services requires a comprehensive and integrated approach that combines the development of digital infrastructure, the strengthening of human capacities, and the modernisation of the legislative and institutional framework. This would contribute to reducing regional disparities and achieving a more inclusive and sustainable digital transformation.

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*Corresponding author

1. Introduction

The rapid development of information and communication technologies has brought about fundamental transformations in the management of public administration and the delivery of government services. Digitalisation has become a strategic option through which governments seek to improve the quality of public services, enhance administrative efficiency, and promote transparency and interaction with citizens. Within this context, the concept of electronic public services has emerged as one of the most important outcomes of the transition towards digital government, as it offers opportunities to simplify administrative procedures, reduce costs, and facilitate access to public services at different times and locations.

Despite the remarkable progress achieved by many countries worldwide in the field of e-government, this development has not been balanced. Clear regional disparities have emerged, reflecting differences in the levels of digital infrastructure, the efficiency of institutional frameworks, and the availability of qualified human resources, in addition to disparities in economic and investment capacities among countries. These factors have contributed to the widening of the digital divide at the global level. Against this background, this research paper seeks to analyse regional disparities in the level of electronic public services using the Online Services Index (OSI) and its sub-indices by identifying patterns of disparity among different regions and determining the main factors that explain them. This contributes to providing an analytical assessment of the current state of digital transformation in the public sector and its development prospects. Accordingly, the study attempts to answer the following main question:

To what extent do the values of the Online Services Index (OSI) reflect the existence of regional disparities in the development of electronic public services, and what are the main factors explaining these disparities?

1.1 Study Significance

The significance of this study lies in its examination of digital transformation in the public services sector as one of the most important pillars of modern development and an effective tool for improving government performance efficiency. It analyses the level of development of electronic public services using the Online Services Index (OSI). Its academic significance also lies in highlighting regional disparities in this field and analysing the factors that explain them. Consequently, it enables decision-makers to identify the strengths and weaknesses of electronic public service systems, thereby enhancing the effectiveness of public policies and directing investments towards supporting digital transformation and reducing the digital divide between countries and regions, in line with the Sustainable Development Goals.

1.3 Study Objectives

This study seeks to achieve the following objectives:

- To provide a conceptual understanding of the Online Services Index (OSI) as a tool for measuring the level of development of electronic public services;
- To analyse regional disparities in the level of electronic public services across the world's different regions;
- To examine the sub-indices that constitute the OSI in order to understand the determinants of government digital performance;
- To identify the main factors influencing the success or failure of digital transformation in the delivery of public services;
- To provide practical recommendations that may contribute to reducing the digital divide and improving the quality of electronic public services.

1.4 Study Methodology

This study adopts a descriptive and analytical approach by describing the current state of electronic public services across different regions using the Online Services Index (OSI) and analysing its data and sub-indices to explain the causes of international and regional disparities in the development of electronic public services. The study also employs regional comparison to highlight gaps in digital performance, thereby allowing for a comprehensive understanding of the nature of digital transformation in the public sector and the identification of its main determinants at the regional and international levels.

2. Concepts Related to Electronic Public Services

2.1 Definition of Electronic Public Services

The concept of electronic public services is relatively new and emerged from the relationship between electronic administration and public service delivery. It has been associated with the rapidly expanding use of modern information and communication technologies to improve services and address administrative problems. These technologies constitute a fundamental basis for rationalising and improving public services, driven by the modern information revolution, which was the principal catalyst for this digital transformation (Abed & Aissaoua, 2021, p. 45).

Electronic public services are defined as all services that can be delivered electronically (Sayeh, 2018, p. 71). They may also be understood as actions or forms of performance that create value and provide benefits to customers through processes stored in the form of algorithms and generally executed by network-based software (Sayeh, 2018, p. 74).

They are also defined as all services delivered electronically by public institutions and as the transition from conducting transactions and providing public services through traditional manual methods to electronic formats to optimise the use of time, money, and effort. In other words, electronic public services involve completing administrative transactions and providing services via the Internet without requiring users to visit public administrations in person to complete their procedures (Zaouche, 2021, p. 13).

Based on the foregoing, electronic public services may be defined as a modern method of delivering public services that relies on the use of information and communication technologies within the framework of electronic administration. It aims to transform administrative transactions and procedures from traditional manual formats into digital ones, thereby enabling the delivery of value-added services to beneficiaries through networks, particularly the Internet, without the need to visit public administrations. These services also contribute to improving quality, accelerating performance, rationalising the use of time, effort, and costs, and addressing administrative problems in light of the transformations brought about by the modern information revolution.

2.2 Objectives of Electronic Public Services

The objectives of electronic public services consist of a set of goals that modern public administration seeks to achieve through the use of information and communication technologies. The most important of these objectives are as follows (Merizig, p. 27):

- Simplifying administrative procedures, reducing bureaucracy, and shortening processing time within the framework of the contemporary management concept of time-based competition;
- Rationalising and reducing costs within the framework of the contemporary management concept of cost management leadership;
- Continuously improving performance in accordance with the contemporary management principle of continuous improvement;
- Improving the quality of public services by providing fast, accurate services that are available around the clock;
- Replacing traditional paper-based administration with electronic administration;

- Replacing centralised decision-making with decentralisation;
- Improving communication between public administration and citizens through multiple electronic channels;
- Enhancing communication and coordination among the departments of the same institution, thereby contributing to the provision of better services (Mahmoud, 2010, p. 36).

2.3 Requirements for the Provision of Electronic Public Services

For electronic public services to be provided efficiently and effectively, a set of fundamental requirements must be met to ensure the success of this digital transformation. These requirements may be summarised as follows:

- **Infrastructure requirements:** Electronic administration requires an appropriate, if not advanced, level of infrastructure, including a modern communications and data network, as well as developed wired and wireless telecommunications infrastructure capable of ensuring communication and the transfer of information among administrative institutions, on the one hand, and between institutions and citizens, on the other (Al-Kubaisi, 2008, p. 36);
- **Human resource requirements:** Qualified human resources constitute the cornerstone of electronic administration, as they play a crucial role in achieving its objectives related to improving public services. The availability of qualified personnel to manage the process, together with the continuous education and training of employees in the use and maintenance of modern equipment and technologies, is among the most important factors ensuring a smooth transition towards achieving the objectives of electronic administration (Al-Ahbani, 2018, pp. 20-21);
- **Political requirements:** Political will must be present, along with the adoption of a genuine reform policy and the monitoring of its implementation to identify and correct deficiencies. Citizens must also be informed and made aware of the necessity of this transformation, while encouraging them to change the culture and habits associated with traditional administration (Zaouche, 2021, p. 360);
- **Financial requirements:** Adequate funding must be provided to enable administrative bodies to conduct regular maintenance and retrain employees and executives in order to maintain the quality-of-service delivery and keep pace with developments in technology and modern management systems. Internet service providers must also be available, with prices kept as affordable as possible to enable the largest possible number of citizens to benefit from electronic services (Chlihi & Grineï, 2019, pp. 189-190);

– **Organisational and legislative requirements:** Electronic public services require a legal framework regulating digital transactions, including the legal recognition of electronic signatures and documents, the protection of personal data and privacy, and the enactment of legislation to combat cybercrime. These requirements are emphasised in the recommendations of the United Nations and the World Bank as essential for ensuring trust in digital services (Mokhtar, 2007, p. 18);

– **Security requirements:** Security requirements are a fundamental component of electronic operations. They aim to protect data and documents during their storage, processing, and transmission, while ensuring their confidentiality and integrity. This safeguards national and personal information and prevents any manipulation or unauthorised alteration (Nasser & Guerichi, 2011, p. 91).

3. Theoretical Background of the Online Service Index (OSI)

3.1 Definition of the Online Service Index (OSI)

The Online Service Index (OSI) is one of the main components of the E-Government Development Index (EGDI) issued by the United Nations. It is a composite index designed to measure the extent to which governments develop and use information and communication technologies to provide public services electronically at the national level. The OSI assesses the readiness and capacity of official government websites and platforms to provide effective, secure, and accessible digital services to citizens, residents, and businesses (United Nations, 2024, p. 45).

The OSI values are based on the results of a comprehensive survey covering all 193 United Nations Member States. This survey evaluates governments' digital presence through official websites and platforms using a standardised questionnaire and precise criteria. The results are presented as a set of standardised index values on a scale ranging from 0 to 1, where a value of 1 represents the highest level of online service provision and a value of 0 represents the lowest level. The OSI is not an absolute measure of e-government quality; rather, it is a relative comparative tool that reflects each country's position in relation to others during a specific period. It also reflects existing digital best practices rather than perfection in performance.

3.2 Sub-Indices of the Online Service Index (OSI)

The Online Service Index (OSI) adopted by the United Nations consists of a set of sub-indices that measure the level of development of digital government services. These mainly include (Khoukhi, 2023, pp. 225-229):

- **Provision of electronic public services:** This refers to the availability of essential government services online and the ability of users to complete their transactions digitally, ranging from obtaining information to completing administrative procedures, making electronic payments, and receiving documents. It therefore reflects the level of maturity of government digital services;
- **Institutional framework supporting e-government development:** This includes the laws, policies, and national strategies that regulate and support government digital transformation, such as the existence of a national e-government strategy, data protection, cybersecurity, and institutional coordination among government entities;
- **Content provision:** This focuses on the quality and comprehensiveness of the information available through government portals in terms of clarity, timeliness, accessibility, and multilingual availability. It also includes the provision of content that serves different categories of users, such as citizens, investors, and visitors;
- **Technological aspects of electronic portals:** These relate to the technical features of government websites and platforms, such as browsing speed, usability, compatibility with smartphones, information security, and accessibility for persons with disabilities, thereby ensuring an effective and secure digital experience;
- **Electronic participation (e-participation):** This refers to the extent to which citizens are enabled to interact and participate in decision-making through digital channels, including online consultations, opinion polls, government forums, and access to open data in order to enhance transparency and accountability.

4. Analysis of Regional Disparities in Electronic Public Services According to the Online Service Index (OSI)

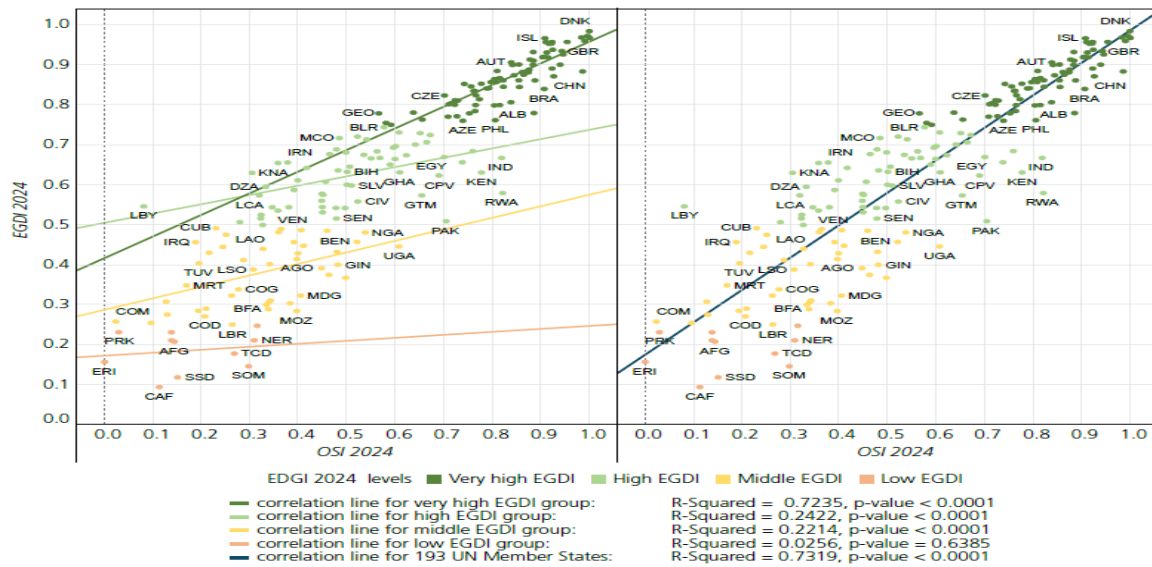
This section analyses regional disparities in the current state of electronic public services using the Online Service Index (OSI) as a reference tool for measuring the level of development of government services provided online. It aims to highlight disparities among regions in the development of digital government services and to explain these gaps in light of the factors supporting e-government.

4.1 Classification of Countries According to the Levels of the Online Service Index (OSI) and the E-Government Development Index (EGDI)

Figure 1 illustrates the distribution of United Nations Member States in 2024 according to their Online Service Index (OSI) levels and their relationship with the levels of the E-Government

Development Index (EGDI). This classification helps identify cases of convergence and divergence between the level of development of electronic public services and the overall level of e-government development, thereby providing an initial understanding of patterns of disparity among countries before proceeding to the detailed analysis.

Fig.1. Distribution of EGDI Levels Relative to OSI Levels for United Nations Member States, 2024



Source:(United Nations, 2024, p. 46)

The analysis of the relationship between the Online Service Index (OSI) and the E-Government Development Index (EGDI) reveals a strong positive correlation at the global level, with the coefficient of determination reaching $R^2 = 0.7319$ and showing a high level of statistical significance. This reflects the central role of electronic services in enhancing e-government performance. However, the strength of this relationship varies according to levels of digital development. It is strongest among countries with very high levels of development, where $R^2 = 0.7235$, reflecting the maturity of integration among the components of e-government. By contrast, this relationship weakens among countries with medium and high levels and is almost absent among countries with low levels, where $R^2 = 0.0256$. This indicates the influence of other structural factors, such as digital infrastructure and institutional capacities. Accordingly, these findings reflect clear regional disparities, with developed countries leading the digital transformation process, while developing countries experience relative delays. It should also be noted that the relationship between the two indices is not entirely linear but is influenced by the developmental and regional context of each country, as illustrated in the following table:

Table 1. Convergence and Divergence of OSI Levels Relative to EGDI Levels, 2024

Member States		Very high EGDI		High EGDI		Middle EGDI		Low EGDI	
		Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Very high OSI	65	61	94%	4	6.2%	-	-	-	-
High OSI	45	15	33%	27	60%	3	6.7%	-	-
Middle OSI	62	-	-	30	48.4%	28	45.2%	4	6.5%
Low OSI	21	-	-	1	4.8%	13	61.9%	7	33.3%
Total	193	76		62		44		11	

Source:(United Nations, 2024, p. 47)

The findings concerning the degrees of convergence and divergence between the levels of the Online Service Index (OSI) and the E-Government Development Index (EGDI) are consistent with the previous analysis, which demonstrated a strong correlation between the two indices. However, despite its apparent strength, this relationship conceals significant structural disparities that reflect differences in countries' digital development trajectories. A high degree of convergence is evident among countries with very high levels, where the levels of the two indices correspond by 94%, reflecting the maturity of digital and institutional integration. By contrast, countries with medium and high levels display a degree of relative divergence, as improvements in the OSI are not directly reflected in the EGDI, which explains the previously recorded weak correlation coefficients. In countries with low levels, a pronounced divergence is observed, with some countries recording higher EGDI levels despite the weakness of their electronic services. This indicates the influence of other factors, such as infrastructure and human capital.

4.1.1 Very High OSI Group

The data presented in the table above show that countries classified within the Very High Online Service Index (Very High OSI) category achieve a high degree of convergence with the E-Government Development Index (EGDI). The overwhelming majority of these countries, representing 94%, also fall within the Very High EGDI category, while only a limited proportion, 6.2%, belongs to the High EGDI category, with no representation at all in the lower categories. This near-complete correspondence reflects structural consistency and functional integration among the components of e-government, including digital services, telecommunications infrastructure, and human capital. It also indicates that the development of electronic services in these countries takes place within a comprehensive strategic framework based on effective digital governance and advanced institutional coordination, ensuring that digitalisation is transformed into integrated government performance. This finding is consistent with the previous analysis, which revealed a strong correlation between the two indices within this category, confirming that

achieving advanced levels of electronic service delivery is closely associated with the overall maturity of the e-government system.

Countries with a Very High OSI level that display disparities in EGDI, TII, or HCI are mainly distributed across Asia, the Americas, and Africa, while Europe and Oceania are absent from such cases. Asia is the most represented and diverse region, as some of its countries combine high OSI and EGDI levels, whereas in other cases the OSI exceeds the overall level of e-government development. The Americas are characterised by relatively greater convergence among the indices, although the respective contributions of HCI and TII to supporting high performance vary. By contrast, the African cases, particularly Kenya and Rwanda, demonstrate that a Very High level of electronic services may be achieved despite relative limitations in certain structural foundations, especially telecommunications infrastructure (United Nations, 2024, p. 47). Accordingly, the regional dimension shows that excellence in electronic public services does not result from a single model but rather from different regional pathways that vary according to the availability of human and technological resources and the effectiveness of digital policies.

4.1.2 High OSI Group

Countries classified within the High Online Service Index (High OSI) category represent a transitional position in terms of their relationship with the E-Government Development Index (EGDI). This group comprises 45 countries, which are unevenly distributed across the different EGDI levels. The largest proportion, 60%, or 27 countries, falls within the High EGDI category, reflecting a considerable degree of convergence and consistency between the two indices within this group. By contrast, only 33%, or 15 countries, correspond to the Very High EGDI category, indicating limited progress towards the highest levels of digital maturity. A small proportion, 6.7%, or three countries, falls within the Middle EGDI category, reflecting cases of partial divergence in the performance of this group.

This distribution can be explained by the fact that these countries are still in the process of strengthening and expanding their digital transformation. Although they have achieved notable progress in developing electronic services, such progress is not always accompanied by a comparable improvement in the other components of e-government, particularly the Telecommunications Infrastructure Index (TII) and the Human Capital Index (HCI). Accordingly, the High OSI category represents a transitional stage between different levels of digital maturity. It is characterised by relative convergence with the EGDI without achieving the degree of integration and consistency that distinguishes countries with a Very High OSI, which explains the disparities observed in their distribution across the EGDI levels.

At the regional level, countries with a High OSI are unevenly distributed, with Europe and Asia clearly dominating, followed by a significant presence from the Americas and relatively limited representation from Africa and Oceania. European countries generally display convergence among OSI, EGDI, HCI, and TII levels, reflecting a more integrated degree of digital maturity. By contrast, some African, Asian, and American countries exhibit cases of divergence, either because the EGDI exceeds the OSI or vice versa, or because TII and HCI remain limited compared with the level of electronic services (United Nations, 2024, p. 48). This confirms that the regional dimension remains a decisive factor in explaining differences in the development pathways of electronic public services, given the varying technological, human, and institutional capacities across regions.

4.1.3 Middle OSI Group

The group of countries with a Middle level on the Online Service Index (Middle OSI) comprises 62 out of the 193 Member States, representing approximately 32.1% of all countries included in the study. This category reflects an important transitional stage in the development of electronic public services, as it includes both cases of convergence with the overall level of e-government development, as measured by the EGDI, and cases of divergence from it. Among countries with a Middle OSI, 28 countries, or 45.2%, also have a Middle EGDI level, indicating relative convergence between the level of electronic services and the overall level of e-government development. By contrast, 30 countries, or 48.4%, fall within the High EGDI category despite maintaining a Middle OSI level. This reflects negative divergence, suggesting that progress in e-government in these countries is primarily attributable to improvements in human capital and telecommunications infrastructure rather than to the development of electronic services themselves.

The regional analysis of countries with a Middle OSI reveals clear disparities among regions in the nature of the relationship between OSI, EGDI, HCI, and TII. In Europe and in some countries of the Americas and Asia, a Middle level of electronic services often exists alongside high levels of EGDI, HCI, and TII. This reflects a gap between the availability of supporting foundations and the full implementation of electronic public services. In Africa and Oceania, however, the Middle OSI level is frequently associated with structural constraints affecting digital infrastructure and human resources, thereby limiting the transition towards higher levels of electronic service maturity (United Nations, 2024, p. 50). Accordingly, the regional dimension reveals that the Middle OSI category constitutes a heterogeneous intermediate group in which digital transformation pathways vary according to the developmental and institutional conditions of each region.

4.1.4 Low OSI Group

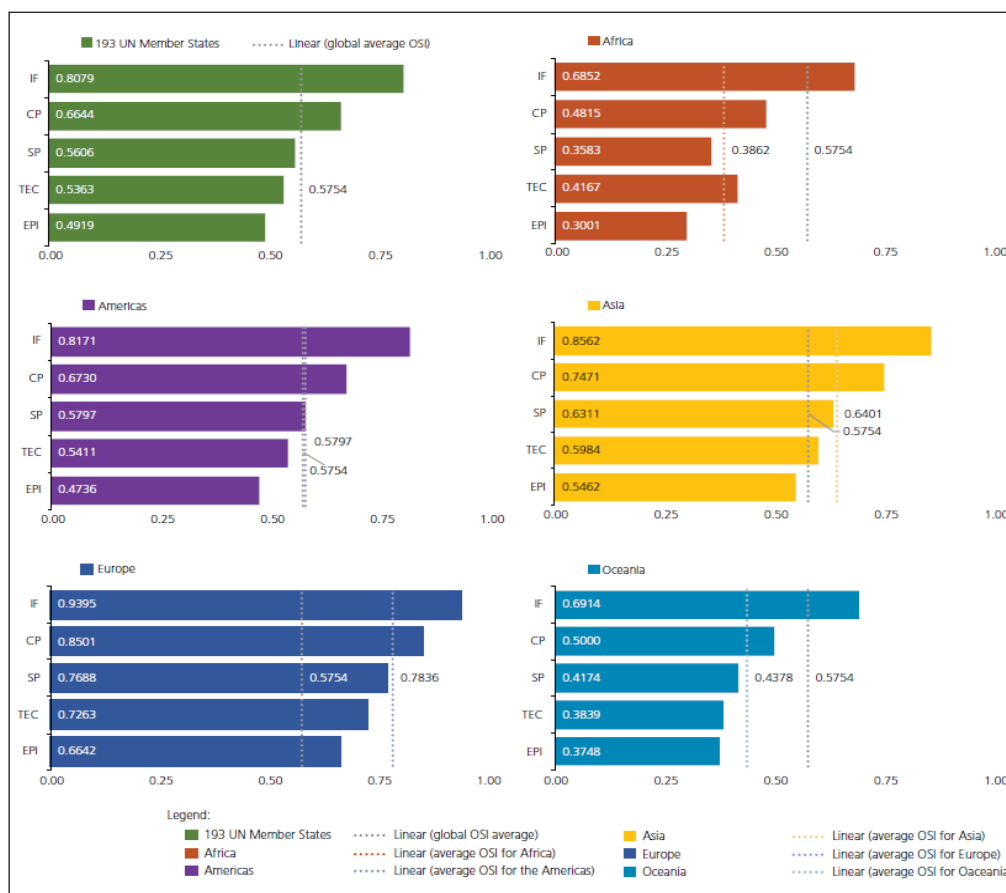
The category of countries with a Low level on the Online Service Index (Low OSI) comprises 21 countries, representing approximately 10.9% of the total. Most of these countries, accounting for 61.9%, fall within the Middle EGDI category. This reflects a situation of negative divergence, indicating that weak electronic services do not necessarily prevent a country from achieving a medium level of e-government development, owing to the contribution of other components, such as telecommunications infrastructure and human capital. By contrast, 33.3% of these countries fall within the Low EGDI category, demonstrating convergence between weak electronic services and generally weak e-government development. The very limited presence of this group within the High EGDI category, together with its complete absence from the Very High EGDI category, confirms that a low OSI constitutes a fundamental obstacle to achieving advanced levels of e-government development. Accordingly, the Low OSI group reflects either a general structural weakness in the foundations of digital transformation or a gap between the availability of digital capacities and their conversion into effective electronic public services.

From a regional perspective, Africa clearly accounts for the largest proportion of countries within this category, followed by a number of countries from Asia, Oceania, and the Americas. This regional concentration indicates that a Low OSI is often associated with less advanced developmental contexts characterised by limited digital access, uneven network coverage, and weak institutional capacities. The inclusion of some small island states, such as Nauru and Tuvalu, within this category also highlights the effect of geographical and demographic constraints in slowing the development of electronic services, even where an acceptable level of human capital is available (United Nations, 2024, p. 51).

4.2 Regional Analysis of the Sub-Indices of the Online Service Index (OSI)

The preceding analysis demonstrates that identifying areas of weakness and imbalance is particularly important for countries seeking to improve their overall level of e-government development, as reflected in the values of the E-Government Development Index (EGDI). When the objective is specifically to improve the performance of electronic services—that is, to increase the values of the Online Service Index (OSI)—it is necessary to examine the sub-dimensions that constitute this index in order to identify the areas requiring more precise and targeted interventions. Accordingly, the following figure presents the main findings of the survey regarding regional disparities in the five sub-indices that constitute the OSI.

Fig.2. Values of the OSI Sub-Indices (IF, CP, SP, TEC, and EPI) at the Regional and Global Levels, 2024



Source:(United Nations, 2024, p. 52)

The data presented in the figure reveal clear regional disparities in the five sub-indices of the Online Service Index (OSI) for 2024, reflecting differences in the levels of maturity of digital public services across regions. At the global level, the Institutional Framework Index (IF) ranks highest among the sub-indices, followed by the Content Provision Index (CP), the Service Provision Index (SP), and the Technology Index (TEC), while the E-Participation Index (EPI) records the lowest value. This indicates that certain aspects of electronic services remain less developed than other dimensions.

At the regional level, Europe leads all regions in terms of average overall performance and the levels of the sub-indices, particularly the IF, CP, and SP indices, reflecting a high degree of digital maturity and integration of electronic services. Asia ranks second, with performance exceeding the global average, indicating tangible progress in the development of digital government services, although it remains below the European level. The Americas record performance close to the global average, reflecting a relatively moderate position. By contrast, Oceania and Africa

perform below the global average, with Africa recording the lowest values in most sub-indices, particularly SP and EPI. This reveals the persistence of structural gaps affecting the quality and integration of electronic services and the participation of users in them. Accordingly, the figure demonstrates that regional disparities in e-government are not limited to the overall level of the OSI but also extend to its individual components, thereby requiring the adoption of more targeted digital policies tailored to the specific characteristics of each region.

4.2.1 Institutional Framework Sub-Index of the Online Service Index (OSI)

The Institutional Framework Sub-Index represents one of the fundamental dimensions of the Online Service Index (OSI), as it measures the availability of the organisational, legislative, and strategic foundations governing the provision of digital government services and supporting users' interaction with public institutions through electronic platforms. Its results revealed the following (United Nations, 2024, p. 53):

Organisational aspects and national portals: The results reflect a relatively advanced level in this area, as the majority of Member States have fully functional national portals. Furthermore, 95% of countries provide information related to government organisation and state structure, thereby helping users understand the structure of the government apparatus and the mechanisms for interacting with it electronically;

Institutional transparency and the availability of information on public officials: A total of 91% of countries provide the names and titles of the heads of government agencies, administrations, and ministries. This enhances institutional transparency and makes it easier for citizens to identify the responsible authorities within the administrative system;

Interconnection between levels of government administration: The data indicate that 75% of countries provide links to government bodies at the local or subnational level, reflecting efforts to achieve greater integration among the different administrative levels within the digital government environment;

Sectoral connectivity and ministry websites: More than 90% of countries have national portals that provide direct links to ministry websites, together with access to information sources on sectoral policies. This reflects considerable progress in organising government information and making it available to users;

Key digital strategies and policies: The results show that between 81% and 83% of countries have national e-government strategies or policies and legislation concerning cybersecurity, data privacy, and data protection. This indicates the existence of an institutional

and legislative foundation supporting digital transformation, although it remains less developed than the organisational aspects;

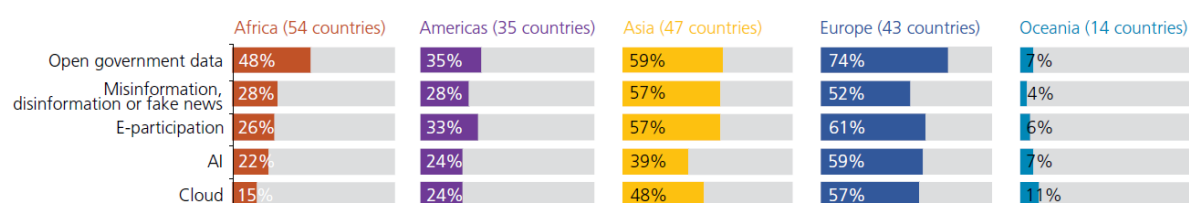
Digital identity and the right of access to information: A total of 78% of countries require the use of a digital identity to access public services, while 76% provide public access to legislation concerning citizens' right to obtain government information. This reflects relative progress in regulating the legal and organisational relationship between the state and digital users;

Open data and e-participation: Levels of development are relatively lower in areas related to open government data and e-participation. Only 63% of countries have legislation or policies specifically addressing open data, while only 51% have adopted e-participation policies. This indicates a relative limitation in embedding the principles of openness and digital interaction;

Addressing emerging digital challenges and modern technologies: The lowest percentages are recorded in areas related to protecting the public from misleading or fabricated information and fake news, at 47%, as well as in policies and legislation concerning modern technologies such as cloud computing, at 44%, and artificial intelligence, at 42%. This reveals that institutional frameworks related to advanced digital transformation remain less mature than the other components.

Accordingly, the results of the Institutional Framework Sub-Index reveal clear progress in the organisational and procedural aspects that facilitate access to government information and services, compared with relatively weaker development in the legislative and policy-related aspects concerning open data, e-participation, and modern digital technologies. This indicates that strengthening this dimension requires not only improving the organisation of government information but also developing legal and strategic frameworks capable of keeping pace with rapidly evolving digital transformations. The regional disparities in these final five indicators are illustrated more clearly in the following figure:

Fig.3. Percentage of Countries with Legislative Frameworks Relevant to E-Government Development, 2024



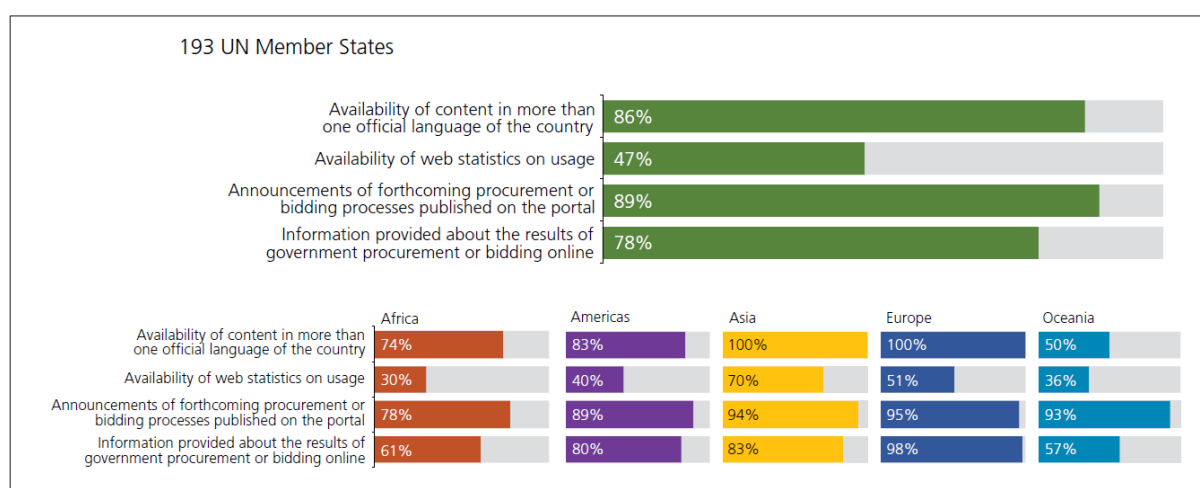
Source:(United Nations, 2024, p. 54)

Figure 3 shows clear regional disparities in the legislative frameworks supporting e-government development. Europe recorded the highest percentages across all five indicators, particularly in open government data, at 74%; e-participation, at 61%; artificial intelligence, at 59%; and cloud computing, at 57%, reflecting greater institutional and legislative advancement. Asia ranks second, with relatively strong performance, particularly in open data, combating misinformation, and e-participation. By contrast, Africa and the Americas display moderate to low levels, with the Americas showing relatively stronger performance in certain areas, such as e-participation and cloud computing, while Africa performs relatively better in open government data. Oceania recorded the lowest percentages across all indicators, indicating the limited development of its legal and regulatory frameworks related to e-government.

4.2.2 Content Provision Sub-Index of the Online Service Index (OSI)

This sub-index measures the availability of digital government content and the ease of accessing it, thereby enhancing the inclusiveness and effectiveness of services. Overall, it records relatively good levels worldwide, although clear regional disparities remain among its various components. At the global level, considerable progress has been made in providing content in more than one official language, at 86%, publishing procurement and tender announcements, at 89%, and providing information on government procurement outcomes, at 78%. By contrast, the publication of website usage statistics remains the weakest aspect, with a rate not exceeding 47%. This indicates limited digital transparency regarding the monitoring of government portal usage, as illustrated in the following figure:

Fig.4. Content Provision on National Portals, 2024 (Percentage of Countries, by region)



Source: (United Nations, 2024, p. 5)

At the regional level, Europe and Asia lead in this sub-index, recording the highest percentages across most components, particularly multilingual content and information concerning

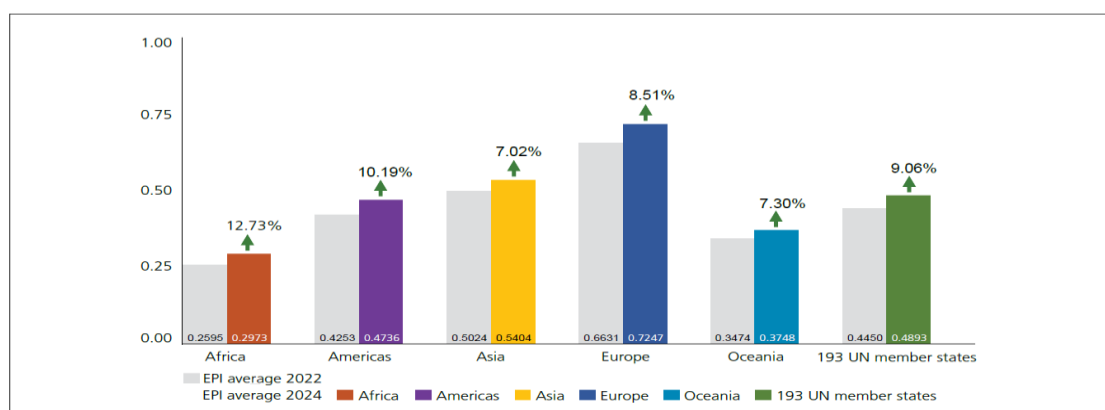
procurement announcements and outcomes. This reflects a higher level of maturity in the provision of digital government content. The Americas also record moderate to good performance, particularly in the area of government procurement. By contrast, Africa and Oceania record relatively lower levels, especially in website usage statistics and procurement outcomes, indicating the continued existence of gaps in the transparency and accessibility of digital content. Accordingly, the figure shows that the main challenge associated with this sub-index concerns not only the provision of content but also the enhancement of digital transparency and the more consistent availability of interactive information across regions.

4.2.3 E-Participation Sub-Index of the Online Service Index (OSI)

This sub-index measures the extent to which governments are prepared to promote participatory and inclusive decision-making at different levels. It is based on a three-level framework of public participation that includes providing information to citizens, involving them in consultations concerning policies and services, and actively engaging them in the decision-making process. Its assessment is based on an analysis of government portals in terms of the availability of mechanisms such as participatory budgeting, open government data, and electronic consultations, in addition to evidence that citizens' views, particularly those of vulnerable groups, are incorporated into public debates and policies.

Although e-participation is the least developed dimension among the five sub-indices constituting the Online Service Index (OSI), as shown in Figure 2, it recorded a notable improvement at the global level. The global average of the E-Participation Index increased by 9%, rising from 0.4450 in 2022 to 0.4893 in 2024. This indicates a gradual increase in governments' interest in expanding channels of interaction and involving citizens in public affairs through digital media, as illustrated in the following figure:

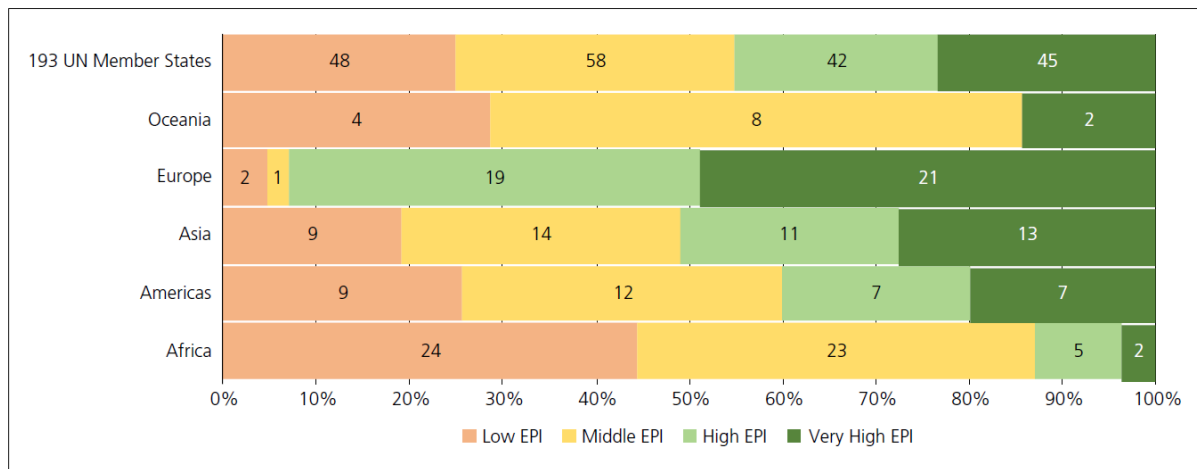
Fig.5. Average EPI Values by Region and Percentage Change between 2022 and 2024



Sources:(United Nations, 2024, p. 56)

Despite the improvement recorded globally in e-participation, it has not led to a significant reduction in regional disparities, as the levels of this index continue to vary considerably across regions. Europe leads by a wide margin, with 93% of its countries falling within the High and Very High EPI categories. This reflects an advanced level of maturity in mechanisms for proactive interaction with citizens and their involvement in public affairs through digital media. Asia ranks second, with 49% of its countries classified within the High or Very High categories, followed by the Americas at 40%. This indicates relative progress in this area, although it remains below the European level. The following figure clearly confirms these regional disparities:

Fig.6. Global and Regional Distribution of Countries by EPI Level, 2024



Source:(United Nations, 2024, p. 57)

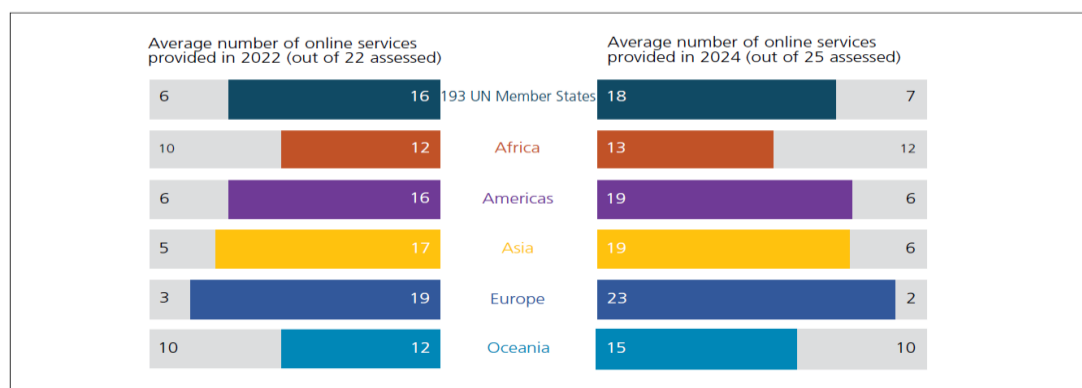
Oceania and Africa record the lowest levels of performance on this index, as the proportion of countries classified within the High and Very High EPI categories does not exceed 14% and 13%, respectively. Most countries in both regions are concentrated within the Low and Middle EPI categories. This situation reflects the limited availability of digital participation mechanisms and the insufficient use of electronic tools to expand interaction with citizens and involve them in consultation and decision-making processes. Accordingly, the figure confirms that progress in e-participation remains regionally uneven, requiring greater efforts, particularly in the lowest-performing regions, to strengthen the participatory and inclusive dimensions of e-government.

4.2.4 Online Service Provision Sub-Index of the Online Service Index (OSI)

This sub-index measures the availability of various interactive and transactional electronic public services and the methods used to access government services, whether through a unified national portal or multiple channels. It also assesses the availability and functionality of electronic public procurement platforms (e-procurement) and digital invoicing systems, the extent to which geographic information systems (GIS) or geospatial data and technologies are integrated into

online service delivery, and the availability of specialised sectoral services and services intended for persons in vulnerable situations or disadvantaged groups. The results of this sub-index at the global and regional levels are illustrated in the following figure:

Fig.7. The Average Number of Online Services Provided Globally and in Each Region in 2022 and 2024



Source:(United Nations, 2024, p. 63)

At the global level, the average number of electronic services provided increased from 16 services in 2022 to 18 services in 2024. However, the proportion of electronic services provided out of the total services assessed remained relatively stable, averaging between 72% and 73%. At the regional level, European countries lead in terms of the average number of electronic services provided, with 23 services, followed by the Americas and Asia, with an average of 19 services each, Oceania with 15 services, and Africa with 13 services. This reflects the persistence of clear regional disparities in the maturity of online government service delivery.

The survey was not limited to verifying the availability of 25 electronic services in Member States; it also assessed the level of full digitalisation of 19 of these services to determine whether transactions could be completed entirely online without requiring an in-person visit. The results show that Europe recorded the highest level of full digitalisation of these services, followed by Asia, the Americas, Oceania, and finally Africa. The highest rates of full digitalisation at both the regional and global levels were recorded for services related to business registration, licence issuance, and tax payments, as well as applications for government employment, with global rates ranging from approximately 48% to 50%.

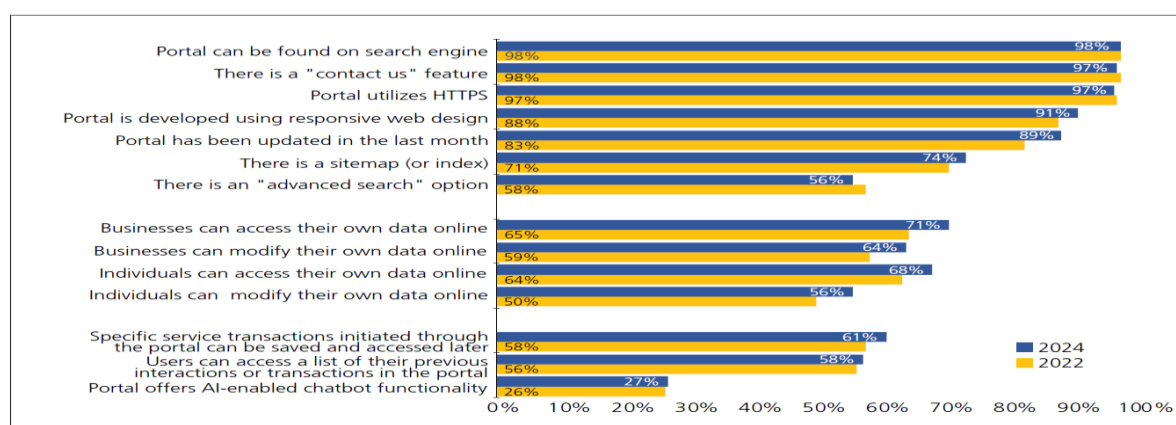
Since 2022, the assessment has also included certain social protection services, such as child, maternity, and unemployment benefits, as well as compensation for job loss. The number of countries providing these services increased by an average of 2% in 2024. However, their full digitalisation remains limited, averaging no more than 25% worldwide(United Nations, 2024, p.

63). Accordingly, these findings reveal that most countries still use their electronic portals primarily to provide information and forms, while the full completion of transactions online remains limited, with in-person attendance still required in many cases.

4.2.5 Technology Sub-Index of the Online Service Index (OSI)

This sub-index measures the availability of the technical requirements necessary to ensure the accessibility, security, and efficiency of digital government portals. The results of the 2024 Survey assessments show that all countries have national portals and that 98% of these portals can be accessed through search engines, reflecting a high level of digital accessibility. Furthermore, 97% of these portals include a “Contact Us” page and use Hypertext Transfer Protocol Secure (HTTPS), thereby enhancing security and improving the user experience. The following figure presents these results in greater detail:

Fig.8. Number of Member States with Portals Incorporating the Assessed Technology Features, 2022 and 2024



Source:(United Nations, 2024, p. 68)

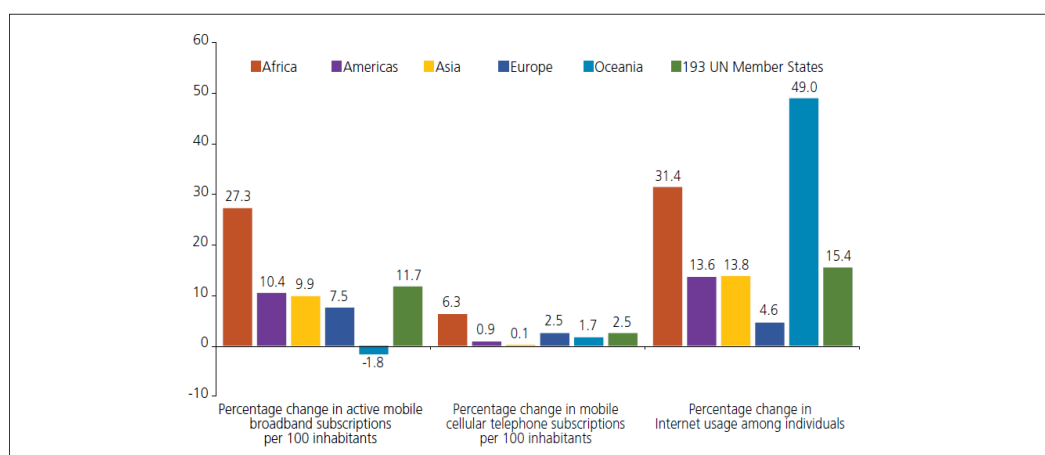
The results of the 2024 Survey show that the technological aspects supporting electronic services have improved considerably at the global level. The proportion of countries whose national portals use responsive web design reached 91%, representing an increase of 3% compared with 2022. Moreover, 89% of these portals are updated at least once a month, representing an increase of 6%. In addition, 74% of the portals provide a site map, while 56% offer an advanced search function, despite a slight decline in this area compared with 2022.

With regard to user data management, the number of countries allowing individuals and businesses to access or modify their data through government portals has increased by an average of 6% since 2022. Access to data remains relatively more widely available than the ability to modify it, for both businesses and individuals. Users in 118 countries can also save electronic

transactions they have initiated and complete them later, while the availability of access to previous transaction records and the use of artificial intelligence-powered chat functions has remained relatively stable.

With regard to the broader digital infrastructure, and as shown in Figure 8, the use of the Internet and subscriptions to mobile broadband and mobile cellular services continued to increase, although clear regional disparities remain. The largest increases in Internet use were recorded in Oceania, at 49%, and Africa, at 31%. Active mobile-broadband subscriptions also increased by 27% in Africa, 10% in both Asia and the Americas, and 8% in Europe, while Oceania recorded a slight decline of approximately 2%. These findings confirm that the development of technological aspects is associated not only with improvements in the features of government portals but also with the expansion of digital access and communications infrastructure at the regional level.

Fig.9. Percentage Change at the Global and Regional Levels in Internet Usage and in Active Mobile-Broadband and Mobile Cellular Subscriptions per 100 Inhabitants, 2022–2024



Source:(United Nations, 2024, p. 69)

Based on the data presented in Table 2 concerning regional results for indicators related to the affordability of mobile services, mobile-broadband and cellular subscriptions, and levels of Internet use in 2022 and 2024:

Table 2. Affordability of Mobile Data and Voice Services, Mobile-Broadband and Cellular Subscriptions per 100 Inhabitants, and Percentage of Individuals Using the Internet, by region, 2022 and 2024

	Affordability		Active mobile broadband subscriptions per 100 inhabitants		Mobile cellular telephone subscriptions per 100 inhabitants		Percentage of individuals using the Internet	
	Mobile data and voice high consumption basket price (as a percentage of GNI per capita)							
	2024	2022	2024	2022	2024	2022	2024	2022
Africa	10.4	-	54.4	42.77	88.95	83.68	43.4	33.01
Americas	3.8	-	72.8	65.96	102.83	101.92	77.1	67.81
Asia	2.8	-	88.5	80.5	106.05	105.93	71.9	63.21
Europe	1.1	-	105.2	97.9	116.75	113.86	89.5	85.52
Oceania	7.6	-	42.4	43.15	73.76	72.53	65.0	43.59
193 UN Member States	5.2	-	76.5	68.47	100.73	98.32	68.3	59.14

Source:(United Nations, 2024, p. 69)

Europe continues to lead all regions in the number of active mobile-broadband subscriptions, with 105 subscriptions per 100 inhabitants, followed by Asia with 89 subscriptions and the Americas with 73 subscriptions. By contrast, affordability emerges as a decisive factor in explaining regional disparities in digital access and e-participation. The cost of active Internet and mobile-broadband subscriptions as a proportion of gross national income per capita remains considerably higher in Africa, at 10.4%, and Oceania, at 7.6%, than in the other regions of the world. This contributes to the persistence of the digital divide and slows the rate at which people benefit from digital government services.

5. CONCLUSION

Electronic public services constitute a central element in the transition towards digital government. However, the analysis of the United Nations Online Services Index (OSI) reveals clear regional disparities in the level of development of these services. The findings show that advanced regions, particularly Europe, achieve high levels of digital service development owing to advanced infrastructure, effective institutional frameworks, and highly qualified human capital. By contrast, some regions, especially Africa, continue to experience low levels of digitalisation and difficulties in providing integrated electronic services on a broad scale.

The findings also demonstrate that the digital divide is not limited to the availability of electronic services but also extends to the quality of digital content, the level of e-participation, and the technological efficiency of government portals. This confirms that achieving effective digital transformation in the public sector requires integration among technological, institutional, and human dimensions rather than merely providing digital services in a formal or information-based manner.

Accordingly, electronic public services constitute an essential driver of public administration modernisation and the improvement of services provided to citizens, provided that a comprehensive and integrated approach is adopted that considers the various technological, institutional, and human dimensions and seeks to reduce the digital divide among regions. This also requires the effective use of information and communication technologies and the strengthening of digital infrastructure capacities to enable the transition from traditional service delivery to more integrated, efficient, and effective electronic services. This may be achieved through the following recommendations:

- **Strengthening investment in digital infrastructure:** This should be achieved by expanding high-speed Internet networks and modernising digital equipment, particularly in countries and regions with low or moderate performance, in order to improve access to electronic services and reduce the digital divide;
- **Developing the legislative and institutional framework:** This requires updating the laws governing electronic services, particularly those relating to digital transactions and personal data protection, while strengthening coordination among government bodies to ensure the effective implementation of e-government;
- **Qualifying and training human resources:** Training programmes for public administration employees in the field of digitalisation should be intensified to improve their ability to use and manage digital systems and develop electronic services;
- **Improving the quality of digital content and services:** Government portals should be developed in terms of usability, their content should be continuously updated, and the range of interactive services should be expanded to respond more effectively to the needs of citizens and institutions;
- **Enhancing citizens' e-participation:** This should be achieved by supporting digital consultation mechanisms and opinion polls and expanding the use of open-data platforms to promote transparency and good governance;
- **Encouraging cooperation and the exchange of digital expertise:** Partnerships among countries and leading institutions in the field of e-government should be strengthened to facilitate the transfer of successful experiences and the exchange of best practices, thereby accelerating digital transformation and reducing regional and international disparities.

6. Bibliography List:

- Abed, A., & Aissaoua, A. (2021). The Electronic Public Service Project in Algeria: Causes of Failure and Proposed Solutions. *National Conference entitled Electronic Public Service in Algeria: Current Realities and Future Challenges*. Setif, Algeria: Faculty of Law and Political Science, University of Setif.
- Al-Ahbani, N. M. (2018). *The Impact of Electronic Administration on the Management of Public Utilities: A Comparative Study*. Egypt: Dar Al-Jamiah Al-Jadidah.
- Al-Kubaisi, K. M. (2008). Requirements for Implementing Electronic Administration at the Information Systems Centre of the E-Government of the State of Qatar. *Master's Thesis in Business Administration*. International Virtual University.
- Chlihi, T., & Grineï, R. (2019). Electronic Administration and Its Contribution to Improving Public Services in Municipalities: A Presentation of the Electronic Municipality Project in Algeria. *Afaq Journal of Management and Economic Sciences*.
- Khoukhi, A. (2023). Challenges of E-Government in Algeria: A Case Study of the Digital Services Index. *Journal of Development Research and Studies*.
- Mahmoud, O. E.-S. (2010). *Modern Trends in Libraries and Information*. Academic Library.
- Merizig, A. (n.d.). *Public Management between Classical and Modern Approaches*. Algeria: Dar Al-Jusur for Publishing and Distribution.
- Mokhtar, H. (2007). The Impact of Electronic Administration on the Management of Public Utilities and Its Applications in Arab Countries. *Master's Thesis, Department of Political Science*. Algiers: Faculty of Law and Political Science, University of Algiers.
- Nasser, M. A., & Guerichi, M. (2011). The Contribution of Electronic Administration to the Development of Administrative Work in Higher Education Institutions: A Case Study of the Faculty of Science and Technology at the University of Biskra. *El-Bahith Journal*.
- Sayeh, F. (2018, 12). Electronic Administration as a Mechanism for Developing Local Public Services, with Reference to the Case of Algeria. *Namaa Journal of Economics and Trade*.
- United Nations. (2024). *E-Government Survey*. Retrieved from Desa Publications: [https://desapublications.un.org/sites/default/files/publications/2024-09/\(Web%20version\)%20E-Government%20Survey%202024%201392024.pdf](https://desapublications.un.org/sites/default/files/publications/2024-09/(Web%20version)%20E-Government%20Survey%202024%201392024.pdf)
- Zaouche, H. (2021). The Conceptual Framework of Electronic Public Services. *National Conference entitled Electronic Public Service in Algeria: Current Realities and Future Challenges*. Setif, Algeria: Faculty of Law and Political Science, University of Setif.