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Analysis of Digital Gaps in the Development of E- government across Africa: A Comparative Study of Performance and Influencing Factors According to EGDI (2020-2022).

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Abstract:

This study aims to analyse the digital gaps in the development of e-government across African countries during the period 2020-2022, with a focus on factors that influence performance according to E-government Development Index (EGDI). The descriptive-analytical method was adopted. The analysis was based on data from the 2022 E-Government Survey, along with factors like digital infrastructure investment, digital education levels, and government policies. The study revealed significant variances in e- government across African countries. Some nations have made substantial progress, while others have faced challenges due to weak digital infrastructure and low levels of digital education. To enhance e- government and regional integration, the study recommends increasing investment in digital infrastructure and technological education.

1. Introduction

In recent years, digital transformation has become one of the most prominent global trends that countries are striving to adopt to enhance administrative efficiency and improve the delivery of public services. E-government is a vital component of this transformation, contributing to achieving transparency, fostering civic participation, and supporting sustainable development (Bertot & et al, 2016). However, African countries have significant variances in the level of e-government development, highlighting the need to understand regional gaps and the factors influencing them, especially in light of indicators such as the E-Government Development Index (EGDI).

Previous studies indicate that the variation in e-government development is attributed to multiple factors, including digital infrastructure, public policies, education levels, and organizational culture. For instance, a study by (Khan, Saleem, & Nawaz, 2021) showed that differences in technological infrastructure and the level of investment in technology represent major barriers for developing countries. Similarly, (Madon & Karanam, 2018) and (Cardenas, Maciel, & González, 2019) emphasized that institutional factors, such as the lack of supporting legislation and weak governance, hinder the adoption of e-government in many Latin American and African countries.

In contrast, reports by the United Nations (2020) indicate that some African countries that strategically invested in digital infrastructure development and government policies have made significant progress in this area. This underscores the importance of studying disparities among countries within the same region to understand the common and distinctive factors (United Nations, 2020).Furthermore, other studies, such as (Reddick & Aikins, 2019) and (Parycek, Schedler, & Jantsch, 2019), have addressed the impact of economic, social, and political challenges on e-government development, focusing on potential solutions to reduce the gaps.

In this study, two terms are going to be used interchangeably, e-government and e-governance, they are considered have the exact same meaning. This use ensures keeping the original concept as used in the references.

Despite previous efforts, there is still a critical need for comparative studies that focus on understanding the digital gaps among African countries with common regional characteristics, as well as identifying the influential factors that contribute to the success of best practices. In this context, the research question arises: **What factors influence the variance in digital performance among African countries in the field of e-government during the period 2020 - 2022?**

This study aims to analyse these regional gaps and identify the factors influencing performance according to the EGDI. It also seeks to provide a

comprehensive perspective that will support the adoption of e-government and reduce digital gaps, contributing to enhancing regional integration and achieving sustainable development in Africa.

2. Literature Review

The analysis of e-government development is closely related to theories of digital governance, which have allowed for the examination of factors influencing the adoption and development of e-services from multiple perspectives. For example, numerous studies have shown that digital infrastructure plays a crucial role in achieving government digital transformation. The digital technology gap between developing and developed countries is one of the main causes of regional variances, as previous literature indicates that digital infrastructure and legal frameworks are key factors in e- government development. Studies such as (Heeks, 2018) and (Khan, Saleem, & Nawaz, 2021) pointed out that the lack of modern technology in developing countries, compared to developed ones, leads to a significant variance in the application of e-government. Similarly,(Cardenas, Maciel, & González, 2019) highlighted that the absence of supportive legislation and weak institutional coordination hinder efforts toward government digital transformation, especially in developing contexts. Despite these important insights, these studies have not deeply addressed the impact of these factors on regional variances within the African continent.

Alongside digital infrastructure, the literature emphasizes economic and social dimensions as essential elements for e-government development. (Madon & Karanam, 2018) Highlighted the importance of education and organizational culture in the success of digital initiatives, while (Parycek, Schedler, & Jantsch, 2019) confirmed the role of regional cooperation in fostering the adoption of e-services and narrowing technological gaps between countries. Although these studies offer valuable insights, they did not focus on a deep analysis of the African context, where challenges and opportunities differ across countries.

(Ding & et al, 2024) examined the impact of digital governance and environmental regulations on the relationship between natural resources and economic growth in G20 countries. The results showed that digital governance contributes to mitigating the "resource curse" effect and emphasized that the relationship between economic variables is characterized by bidirectional causality. These findings can be applied to developing countries, where digital governance and environmental regulations are key tools for addressing economic performance imbalances related to natural resources.

(Mogale, 2021) study outlined the challenges faced by e-government programs in developing countries, including the digital gap, resistance to change, lack of skills, and the absence of supportive legislation. The study concluded that

the success of these programs depends on understanding local contexts and their impact on implementation. This factor is crucial in explaining the variances between developing and developed countries in the EGDI, highlighting the importance of supporting infrastructure and enhancing local capacities.

(Wu & et al , 2024) highlighted the importance of e-governance as a mediating factor between mineral resources and stringent environmental policies to achieve sustainable economic growth. Using a quantitative regression methodology, the results indicated that e-governance significantly enhances the positive impact of mineral resources and environmental policies. These findings underscore the importance of e-governance as a tool for improving economic efficiency in resource-rich African countries.

The political and social dimensions play a central role in shaping the level of e-governance. According to the United Nations Report (2020), political commitment from governments is a critical factor in the development of digital services. These studies emphasize the importance of economic incentives and clear legislation in achieving better outcomes. However, there remains a need for studies that explore how these factors can explain regional variances among African countries.

The literature also discusses public-private partnerships as a tool for enhancing digital infrastructure and expanding access to e-services. For instance, studies by (Reddick & Aikins, 2019) have highlighted the role of partnerships in bridging technological gaps by improving available resources. However, the application of these findings to the African context has not received sufficient attention, as the nature and potential of these partnerships vary across countries.

On the international level, literature has discussed successful experiences in e-governance that can be used to improve regional performance. (Troitiño & et al, 2024) examined the European experience, emphasizing the role of digital integration in enhancing regional cohesion and improving governmental processes. (Li & et al, 2024) highlighted the importance of digital governance in mitigating the resource curse and achieving economic efficiency. While these studies provide reference models, they do not adequately explain how these models can be adapted to address regional variances among African countries.

(Khan & et al, 2024) explored the relationship between information technology, e-governance, and sustainability, emphasizing the importance of institutional quality and research and development in achieving sustainability. The study used data from countries involved in the Belt and Road Initiative and confirmed the importance of investing in digital infrastructure and sustainable city planning. These findings are relevant in explaining how digital sustainability can be achieved in developing African countries.

(Decuypere & Lewis, 2021) introduced a new methodology called "topological genealogy" (TG) to study cross-border digital governance. This methodology focuses on the joint production of digital infrastructures and policymaking as part of governance and how both influence flows and changes. The study used the eTwinning platform as a case example to illustrate how digital governance can be analysed using TG, providing new methodological insights for data formation and analysis, as well as a deeper understanding of the role and behaviour of researchers in this context.

Additionally, (Zou & at al, 2023) examined the impact of e-government on various dimensions of governance. The study found noticeable improvements in voice and accountability, government effectiveness, and regulatory quality, while the effects on political stability and control of corruption were limited. These findings highlight the gap between policy and practical vision and call for the improvement of digital strategies to achieve comprehensive results.

(Mekonnen Jonathan & et al, 2024) explored the relationship between digital transformation and decentralization, with their findings highlighting the enhancement of public administration efficiency and increased citizen participation, contributing to sustainable governance and public trust. These results support the idea that digital transformation can reinforce decentralization by empowering local governments.

Despite the progress made by previous literature, a clear gap remains in understanding the regional variances in e-governance levels within the African continent. The studies lack comprehensive analyses that connect the economic, social, and political factors shaping these gaps, particularly in light of the (2020-2022) EGDI. Furthermore, insufficient attention has been given to the shared and unique factors influencing digital performance in African countries, which hinders the provision of practical recommendations for enhancing regional integration.

This study aims to fill this research gap by conducting a comparative analysis of African countries' performance according to the EGDI (2020-2022). It also seeks to explore the role of digital infrastructure, legislation, and institutional quality in shaping these gaps, with the goal of providing practical recommendations to improve regional integration and enhance digital equity among African countries.

3. Data and Methodology

E-Government is one of the modern tools that countries rely on to enhance transparency and efficiency in the provision of public services. It has become an important indicator for measuring digital performance and the readiness of countries to employ technology in managing their affairs. In this context, the

importance of the EGDI emerges as a comprehensive tool that measures the progress of countries in this area, based on three main components: e-services, digital infrastructure, and human capital. This index is calculated using the following formula:

EGDI = (OSI + TII + HCI) ÷ 3

Where, (OSI) stands for Online Services Index, (TII) stands for Telecommunication Infrastructure Index, and (HCI) stands for Human Capital Index.

The study relies on analysing the three sub-indices that make up the EGDI, in addition to examining a set of explanatory factors that influence the digital gap between African countries, such as the level of education, the volume of investments in digital infrastructure, government policies, political and economic stability, and digital culture. Through this analysis, the study seeks to provide a deeper understanding of the factors that contribute to narrowing or widening the digital gap between the countries of the continent, with a focus on the dimensions of e-governance.

The aim of this study is to analyse the digital variances between African countries based on their performance in the EGDI. The study relied on data from the United Nations e-government survey of 2022, covering the period from 2020 to 2022. A descriptive-analytical method was used to classify and analyse the data presented in the report, with the aim of identifying the relationships between the study variables, which can be summarized as follows:

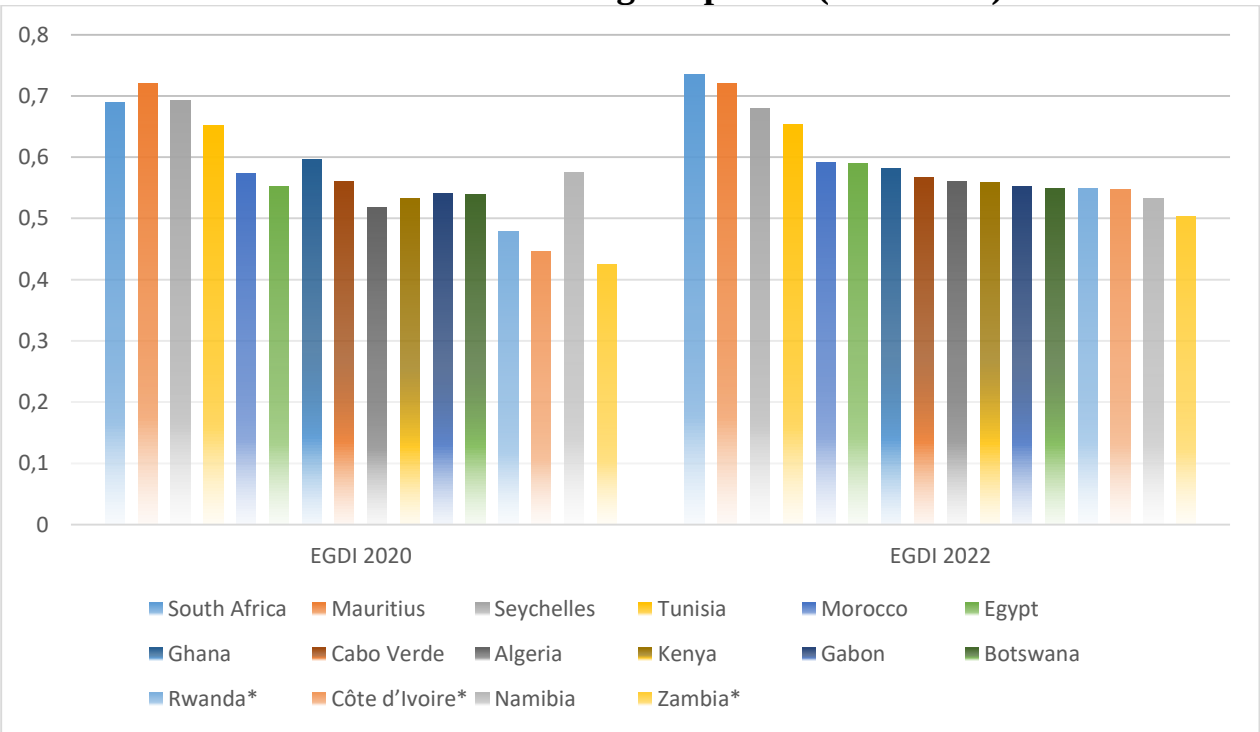
Independent Variable	Digital Performance of African Countries in the EGDI Index	Measures the digital performance of countries based on three sub-indicators: e-services, digital infrastructure, and human capital.
Dependent Variable	Digital Performance Gaps Between African Countries	Reflects the regional gaps between countries in terms of their digital readiness and e-governance.
Explanatory Variables	- Level of Education - Size of Investments in Digital Infrastructure - Government Policies - Political and Economic Stability - Digital Culture	Represents the factors influencing the digital gap between African countries.

This study combines a descriptive approach, which aims to provide an accurate description of the digital performance of African countries, and an analytical approach that focuses on interpreting the reasons for digital variances and linking them to influencing factors. This integration contributes to providing a comprehensive view of the level of e-governance in Africa and the factors that impact its development.

4. Results and Discussion

The table provided in Appendix (01) illustrates the performance of African countries in the EGDI for 2022, compared to 2020, with a focus on the changes in the values of the three sub-indicators: the Online Services Index (OSI), the Telecommunication Infrastructure Index (TII), and the Human Capital Index (HCI). The analysis highlights the variance in performance among African countries, drawing on the literature to identify the main reasons that explain these differences. Additionally, the evolution of e-governance indicators can be observed in the following chart:

Figure No. (01): Evolution of e-government Development Index (EGDI) in African countries during the period (2020-2022).

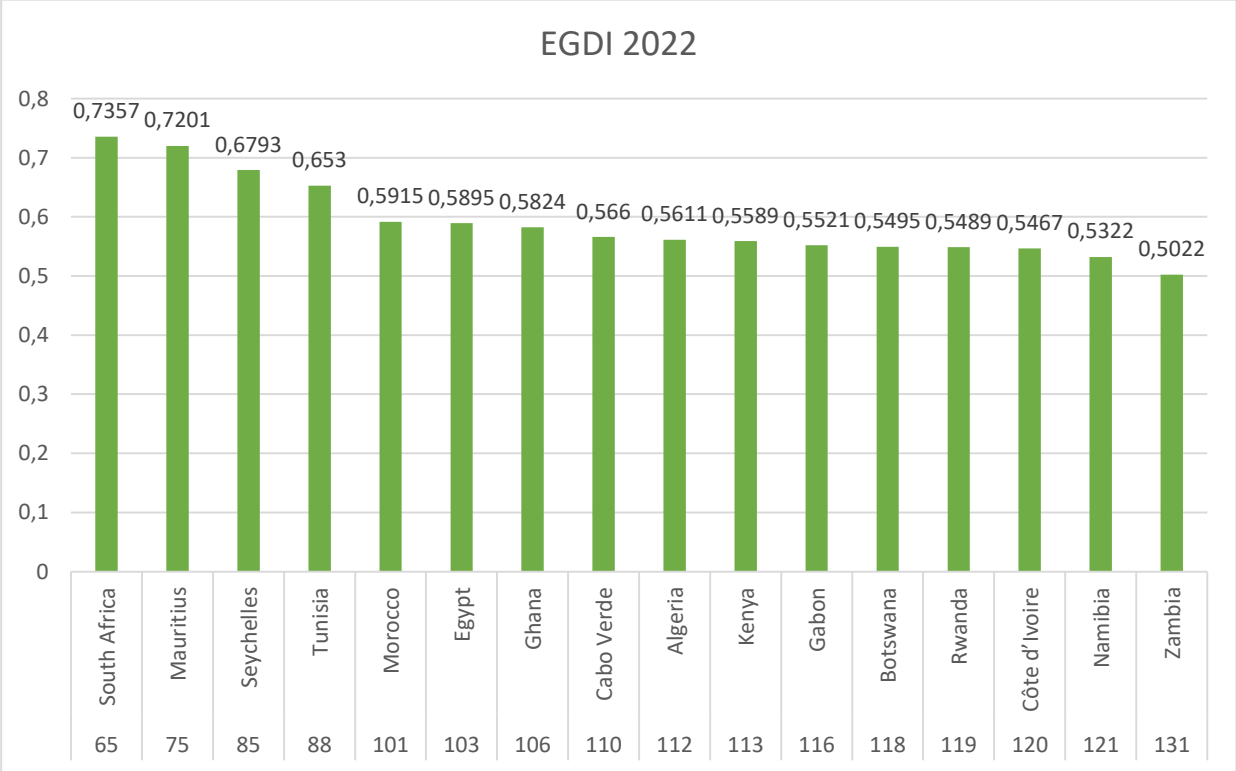


Source: Prepared by the researchers, based on Appendix No. (01).

Figure No. (01) reflects the gradual development in the performance of African countries in the field of e-governance between 2020 and 2022, highlighting the differences between countries in terms of digital performance levels. Some countries have seen significant improvement in enhancing digital

services infrastructure and telecommunications infrastructure, while others continue to face challenges in achieving this improvement. The analysis, based on previous literature, indicates that factors such as investments in digital infrastructure and the level of technical education play a crucial role in accelerating or slowing down this development, thus emphasizing the need for more attention to strengthen these areas for better regional outcomes. Additionally, the evolution of the e-governance index for African countries in 2022 can be highlighted, with a focus on their global ranking, as shown in the following figure:

Figure No. (02): E-Governance Index for 2022 of African countries with their global rankings.



Source: Prepared by the researchers, based on Appendix No. (01).

Based on the analysis of the information presented in the two preceding figures and appendix (01), it is evident that South Africa leads the performance index with an EGDI score of 0.7357, reflecting its excellence in the field of e-governance. This superiority is attributed to substantial investments in telecommunications infrastructure, as indicated by a TII score of 0.6850, in addition to significant improvements in the delivery of electronic services, which achieved an OSI score of 0.7487. South Africa can be considered a successful model in leveraging public-private partnerships to enhance digital transformation, as confirmed by the United Nations reports of 2022. Studies further indicate that

integrated technological policies were a critical element in improving the quality of electronic services provided. As noted by (Ojo & et al , 2015), these policies were essential in supporting this transformation. The reasons for South Africa's excellence can be summarized in three main pillars: first, infrastructure, including major investments in developing telecommunications and IT networks; second, the provision of high-quality, accessible electronic services, reflecting a supportive institutional environment; and third, human capital, whose capabilities have been enhanced through educational programs tailored to support digital transformation.

Mauritius ranked second with an EGDI score of 0.7201, reflecting its outstanding performance in the field of digital governance. This performance is due to the effective integration of human capital, which achieved an HCI score of 0.7733, and telecommunications infrastructure, with a TII score of 0.7588. This distinction reflects the stability of government policies directed towards digital transformation, in addition to promoting technological education nationwide, which contributes to developing the digital skills of its population.(Gupta, Khatri, & Garg, 2020) highlight that Mauritius serves as a successful model for small nations relying on telecommunications technologies to improve governance and enhance administrative efficiency. Furthermore, (Ramgolam, Gungah, & Lutchman, 2020) emphasize in their study on digital transformation applications in small-sized states that Mauritius's success is attributed to several key factors, most notably education. The population enjoys a high level of technical knowledge, which strengthens the state's capacity for digital transformation. Additionally, digital integration in Mauritius is achieved through balanced policies combining education and the development of ICT infrastructure, thereby improving electronic services and promoting good governance.

In the context of the average performance of countries according to the EGDI, Algeria demonstrates significant progress in some aspects, with its EGDI value improving from 0.5173 in 2020 to 0.5611 in 2022. This improvement is primarily attributed to an increase in the Human Capital Index, which reached 0.6956, reflecting tangible efforts to enhance education and technical skills among individuals. However, the overall performance remains constrained due to the weak performance of the Online Services Index (OSI), which recorded only 0.3743. This shortcoming represents a major challenge, as online services are the cornerstone of digital transformation, hindering Algeria's transition to the high-performing category.

The weakness in the Online Services Index reflects multiple structural challenges. According to the (United Nations, 2020), online services are at the heart of digital transformation, and when they are weak, achieving integration

between digital policies and practical implementation becomes difficult. On the other hand, (Alomari, Sandhu, & Woods, 2020) suggest that improving digital services in developing countries primarily depends on developing digital infrastructure and adopting comprehensive and integrated strategies.

Tunisia maintained stability in its EGDI score for 2022 at 0.6530, reflecting a moderate balance between digital infrastructure and human capital development. This performance is attributed to ongoing investments in education and digital training; however, the lack of technological innovation poses a significant challenge to achieving rapid growth. Digital advancement requires the adoption of modern technologies and support for research and development (Alawadhi, Shareef, & Dwivedi, 2022). Despite having an adequately available digital infrastructure, it requires continuous updates to improve efficiency and reliability (Mhemdi & Ayadi, 2023). Additionally, although human capital development efforts are evident, they still need time to have a tangible impact on digital indicators, particularly by enhancing the technical skills of the youth (Ben Arbia, 2022). Moreover, the absence of sustainable digital strategies limits the realization of qualitative leaps, necessitating flexible and long-term policies to increase the effectiveness of digital transformation (Zitouni & Jaziri, 2022).

Recent indicators reveal that Zambia recorded a low performance on the EGDI, with a score of 0.5022. This is primarily attributed to weak telecommunications infrastructure (TII: 0.3909) and online services (OSI: 0.4414). These challenges stem from insufficient funding for implementing digital projects, negatively impacting the country's ability to improve communication networks and digital infrastructure (Mutale & Phiri, 2020).

Similarly, Rwanda faces comparable challenges, despite achieving notable improvements in online services (OSI: 0.7935). However, telecommunications infrastructure remains a significant barrier (TII: 0.3209), highlighting the critical need for investments in developing communication networks to support e-governance. Weak financial resources and macroeconomic challenges pose major obstacles for these countries in attracting the necessary investments. This underscores the need for adopting national strategies to fund and develop digital infrastructure (Chilufya & Kalunga, 2022).

The literature also suggests that improving education and training in the field of technology can contribute to ensuring the sustainability of these digital projects.

E-governance is considered a fundamental tool for achieving digital transformation and developing public services. However, the performance gap between countries reflects various challenges linked to multiple factors, including digital infrastructure, education levels, institutional trust, and political stability.

The following table summarizes the main reasons for variances in EGDI indicators and the proposed solutions for improving these indicators, based on recent academic references.

Factor	Cause/Current Situation	Impacts	Proposed Solutions
Telecommunications Infrastructure (TII)	Insufficient investment in digital infrastructure affects the quality of e-services.	Improved internet access is essential for enhancing EGDI scores.	Strengthen investment in digital infrastructure.
Human Capital (HCI)	Low education levels reduce citizens' ability to utilize digital services.	Limited digital readiness in some countries.	Invest in technological education.
Online Services (OSI)	Variations in the quality and availability of e-services reflect a gap in implementing digital governance strategies.	Enhancing access to digital services requires effective policies for technological development.	Develp technological infrastructure.
Economic and Political Challenges	Economic and political conditions impact countries' ability to implement e-governance strategies.	Countries experiencing political crises face difficulties achieving digital stability.	Improe political and economic stability and promote digital policies.
Digital Culture and Trust	Weak digital culture and lack of trust between citizens and government institutions.	Negatively affects the use of digital services.	Enhane user experience and foster interaction between citizens and institutions.
Weak Digital Infrastructure	Lack of technical knowledge and weak digital infrastructure in	Delays progress in egovernance adoption.	Strengthen digital education programs and

	some countries (e.g. Nigeria).		develop digital infrastructure.
Trust and Transparency	Weak trust in government institutions and lack of transparency in digital services.	Limits citizens' willingness to adopt e-governance.	Enhane transparency and continuous engagement with citizens.

***Source**: Prepared by the researcher based on a review of previous literature.*

The reasons for the variation in the EGDI indicators reflect multiple challenges that differ across countries based on their level of digital and social advancement. One of the main factors hindering access to high-quality e-services is the weakness of digital infrastructure, as a lack of investment in infrastructure affects the performance of the index. For example, research has shown that improving internet access and expanding communication networks are essential for supporting e-governance efforts (Gupta, Singh, & Kumar, 2020) and (Ramgolam, Nundoochan, & Bheemul, 2019).

In addition, human capital, or what is known as technological education levels, plays a significant role in enhancing digital readiness. A lack of technical education reduces the population's ability to benefit from digital services, which can be addressed by strengthening technological education programs, as highlighted by related studies (Mutale & Phiri, 2020).

A significant gap exists in the quality and availability of e-services between countries due to the lack of effective digital governance strategies. Research highlights the importance of establishing policies that support the development of technological infrastructure to improve these services, as studies have shown that countries adopting such policies perform better in using e-services (Ojo, Janowski, & Estevez, Policy frameworks for digital government development, 2021).

On the other hand, bad economic and political conditions negatively affect the ability of countries to achieve digital stability and implement e-government strategies. Countries facing political and economic crises often struggle to make digital progress, emphasizing the importance of political and economic stability to ensure the success of e-government initiatives (Ndahimana, Umutoni, & Nkurunziza, 2021).

Experiences in some countries suggest that enhancing trust in government institutions and transparency are fundamental pillars for citizens' adoption of e-services. Additionally, a lack of digital culture and insufficient interaction

between citizens and governments pose significant barriers. Experiences in Nigeria have shown that challenges related to weak technical knowledge and the absence of digital infrastructure can be overcome by investing in digital education and improving communication networks (Kumar, Adeola, & Musa, 2023). In Thailand, previous studies have demonstrated that enhancing transparency and continuous engagement with citizens are key factors in building trust and increasing the uptake of e-services (Nookhao & Kiattisin, 2023).

5. Conclusion

E-governance is a pivotal tool for achieving digital transformation and enhancing the quality of public services. In light of the issues discussed, the study's findings indicate that regional variances in the development of e-governance among African countries are attributed to multiple factors, including digital infrastructure, human capital, the quality of e-services, and political and economic stability.

The study highlights that the weakness of digital infrastructure is one of the main challenges facing African countries, as the lack of investment in communication networks and the low expansion of internet coverage affects the quality of e-services provided. The findings suggest that improving these aspects is essential to enhance the performance of e-governance indicators.

In terms of human capital, the lack of technological education levels is a significant barrier to the population's ability to effectively use digital services. Therefore, this area can be improved by investing in digital and technical education, which enhances digital readiness and reduces gaps between countries.

Regarding the quality of e-services, the study shows that variances in the implementation of digital governance strategies among countries lead to significant gaps in the availability of these services. The analysis emphasizes the importance of developing effective policies that support the improvement of technological infrastructure and ensure equitable access to services.

Furthermore, political and economic conditions have a significant impact on the ability of countries to achieve digital transformation. Countries facing instability struggle to implement e-governance strategies. Thus, achieving political and economic stability is considered a fundamental condition for providing an environment conducive to the development of e-governance.

Finally, the study points out that the lack of trust in government institutions and the absence of transparency hinder citizens' adoption of digital services. This challenge can be overcome by improving the user experience, fostering continuous interaction between citizens and government institutions, and encouraging transparency in all digital processes.

Based on the ongoing results, the following recommendations can be proposed:

- **Enhance investment in digital infrastructure** by improving communication networks and expanding internet coverage to ensure equitable access to e-services.
- **Develop technological education** by investing in educational programs focused on digital and technical skills.
- **Improve the quality of e-services** by implementing strategies that support the development of digital services in line with users' needs.
- **Achieve political and economic stability** by strengthening policies that support stability to ensure a favourable environment for digital transformation.
- **Enhance the user experience** by simplifying services and increasing interaction between citizens and governments.

In conclusion, the study confirms that addressing challenges related to digital infrastructure, education, service quality, and political and economic stability is crucial for narrowing the performance gap among African countries and enhancing comprehensive digital transformation. Implementing these recommendations will support the achievement of effective and sustainable e-governance.

6. Références

1. *Alawadhi, S., Shareef, M., & Dwivedi, Y. (2022). ICT Innovation and E-Government Development. Technological Forecasting & Social Change.*
2. *Alomari, M., Sandhu, K., & Woods, P. (2020). E-government adoption in developing countries: Factors and challenges. International Journal of Public Sector Management, 33(4), 401-417.*
3. *Ben Arbia, M. (2022). Human Capital Development in Tunisia: Opportunities and Challenges. Mediterranean Journal of Social Sciences.*
4. *Bertot, J., & et al. (2016). Using ICTs to create a culture of transparency: E-government and social media as openness and anti-corruption tools for societies. Government Information Quarterly, 33(4), 1-8.*
5. *Cardenas, J., Maciel, J., & González, J. (2019). E-government in developing countries: The case of Latin America. Information Development, 35(4), 635-647.*
6. *Chilufya, M., & Kalunga, L. (2022). Economic Barriers to Digital Development in Sub-Saharan Africa. African Economic Studies.*

7. *Decuypere, M., & Lewis, S. (2021). Topological genealogy: A methodology to research transnational digital governance in/through/as change. Journal of Education Policy, 38(1), 23-45.*
8. *Ding, G., & et al. (2024). Moderating effect of digital governance and eco-policy stringency in realizing natural resources-growth nexus: Role of financial development and FDI in G20 countries. Resource Policy, 83, 10497.*
9. *Gupta, A., Singh, A., & Kumar, R. (2020). Internet infrastructure as a determinant of digital governance. Journal of Digital Transformation.*
10. *Gupta, M., Khatri, S., & Garg, S. (2020). Digital transformation in small nations: Mauritius as a case study. Journal of Digital Governance, 8(3), 124-136.*
11. *Khan, S., & et al. (2024). ICT diffusion, e-governance, and sustainability in the digital era. Sustainable Futures, 100272.*
12. *Khan, S., Saleem, M., & Nawaz, N. (2021). Bridging the gap: A case study of e-government in Pakistan. Journal of Information Technology & Politics, 18(3), 211-227.*
13. *Kumar, S., Adeola, O., & Musa, K. (2023). Addressing challenges in e-government adoption in Nigeria and Pakistan. Journal of E-Governance Studies.*
14. *Li, J., & et al. (2024). Natural resources, economic complexity and growth nexus: Role of digital governance in addressing the resource curse. Resources Policy, 92, 105003.*
15. *Madon, S., & Karanam, A. (2018). E-government in developing countries: An overview. International Journal of Public Administration, 41(2), 149-160.*
16. *Mekonnen Jonathan, G., & et al. (2024). Digital transformation-driven decentralisation of public governance. Procedia Computer Science, 239, 1220-1229.*
17. *Mhemdi, H., & Ayadi, N. (2023). Infrastructure and Its Role in Digital Transformation. . International Journal of E-Government Studies.*
18. *Mogale, B. (2021). A review of critical factors impacting the implementation of e-government in developing countries. (Master's dissertation). University of Cape Town.*
19. *Mutale, C., & Phiri, M. (2020). Digital Infrastructure Challenges in Zambia. Journal of Digital Governance.*
20. *Mutale, M., & Phiri, B. (2020). Technological education and digital readiness. Education and Information Technologies.*
21. *Ndahimana, P., Umutoni, J., & Nkurunziza, D. (2021). Economic and political stability in digital governance. African Journal of Digital Policy.*
22. *Nookhao, P., & Kiattisin, S. (2023). Trust and transparency in e-government initiatives in Thailand. Asian Journal of Public Administration.*
23. *Ojo, A., & et al . (2015). Designing next generation smart city initiatives - The SCID framework. In Advances in Intelligent Systems and Computing, 47-60.*
24. *Ojo, A., Janowski, T., & Estevez, E. (2021). Policy frameworks for digital government development. Government Information Quarterly.*
25. *Parycek, P., Schedler, K., & Jantsch, A. (2019). E-Government development in a comparative perspective: An analysis of countries in Europe. Information Systems Management, 36(1), 62-75.*
26. *Ramgolam, P., Nundoochan, A., & Bheemul, V. (2019). Enhancing EGDI through digital investments. International Review of Digital Economics.*
27. *Ramgolam, S., Gungah, S., & Lutchman, S. (2020). Harnessing ICT for governance in small island states: The case of Mauritius. International Journal of Public Administration in the Digital Age, 6(4), 77-89.*
28. *Reddick, C., & Aikins, S. (2019). E-Government in developing countries: Challenges and opportunities. Government Information Quarterly, 36(2), 128-137.*
29. *Troitiño, D., & et al. (2024). E-governance and integration in the European Union. Internet of Things, 27, 101321.*

30. *United Nations. (2020). E-Government Survey 2020: Digital government in the decade of action for sustainable development. United Nations, Department of Economic and Social Affairs.*
31. *Wu, W., & et al . (2024). Do E-governance, mineral resources, and policy stringency facilitate economic growth in selected resource-rich countries? Resources Policy, 93, 105048.*
32. *Zitouni, S., & Jaziri, A. (2022). Policy Design for Sustainable E-Government. Policy and Governance Review.*
33. *Zou, Q., & at al. (2023). Vision and reality of e-government for governance improvement: Evidence from global cross-country panel data. Technological Forecasting and Social Change, 194, 122667.*

7. Appendices List

Appendix 1: Countries in Africa with the highest EGDI values

Countr	Rating class	EGDI rank	Subregion	OSI value	HCI value	TII value	EGDI (2022)	EGDI (2020)
South Africa	HV	65	Southern Africa	0.7487	0.7733	0.6850	0.7357	0.6891
Mauritius	HV	75	Eastern Africa	0.6282	0.7733	0.7588	0.7201	0.7196
Seychelles	H3	85	Eastern Africa	0.4424	0.7758	0.8198	0.6793	0.6920
Tunisia	H3	88	Northern Africa	0.6031	0.6911	0.6646	0.6530	0.6526
Morocco	H2	101	Northern Africa	0.4721	0.6350	0.6676	0.5915	0.5729
Egypt	H2	103	Northern Africa	0.5730	0.6375	0.5579	0.5895	0.5527
Ghana	H2	106	Western Africa	0.5361	0.6176	0.5934	0.5824	0.5960
Cabo Verde	H2	110	Western Africa	0.4965	0.6507	0.5507	0.5660	0.5604
Algeria	H2	112	Northern Africa	0.3743	0.6956	0.6133	0.5611	0.5173
Kenya	H2	113	Eastern Africa	0.6821	0.5641	0.4305	0.5589	0.5326
Gabon	H2	116	Middle Africa	0.3578	0.6706	0.6279	0.5521	0.5401
Botswana	H1	118	Southern Africa	0.2740	0.6932	0.6814	0.5495	0.5383
*Rwanda**	H1	119	Eastern Africa	0.7935	0.5322	0.3209	0.5489	0.4789

*Côte d'Ivoire**	H1	120	Western Africa	0.5467	0.5748	0.5186	0.5467	0.4457
Namibia	H1	121	Southern Africa	0.4316	0.6516	0.5133	0.5322	0.5747
*Zambia**	H1	131	Eastern Africa	0.4414	0.6744	0.3909	0.5022	0.4242

***Sources*:** 2020 and 2022 United Nations E-Government Surveys.