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E-Governance: Origin, challenges, and prospects in the era of ICTs and artificial intelligence

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Abstract

Nowadays, information and communication technologies are revolutionizing all aspects of our daily lives. Public governance has grown up to take advantage of them. The integration of ICTs has generated the e-Governance concept, which has significantly improved the delivery of public services to all citizens, and consequently the overall objective of improving the performance of governance systems at all levels, as well as strengthening the public governance framework of the whole society. By exploring the origin and evolution of e-governance over time and space, this research highlights theoretical and empirical findings about the potential implications of ICT integration in public governance systems. Additionally, opportunities for effective integration of ICT into local governance systems were identified and discussed, based on concrete examples of effective implementation. Afterwards, this paper provides several challenges currently facing e-governance, including Internet access, security and privacy, ethical regulation, professional skills and environmental issues. Finally, it discusses the perspectives raised by artificial intelligence (AI) as it evolves to improve data-driven decision-making, automate repetitive tasks and enable personalized services.

Keywords: E-governance, public governance, information and communication technologies, artificial intelligence.

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Introduction

In the era of information and communication technologies (ICT) and artificial intelligence, power is entrenched within the interconnected global network and the intricately structured information system. Consequently, the importance of ICT is growing in both the public and private sectors, giving birth to a number of emerging concerns. In this context, e-governance is being promoted in most countries around the world to provide effective electronic services to their citizens (Gupta et al., 2019). ICTs have introduced alterations in the realm of public administration, wherein the utilization of new technologies is reshaping the methods through which public institutions interact and engage in communication with both their counterparts and the general public (Kim, 2005b). As a result, ICT is rapidly emerging as a catalyst for revitalization and metamorphosis in numerous nations. Governments worldwide strive to leverage the vast Internet capabilities to instigate sectoral restructuring across the public sector, and to develop new models to overcome the shortcomings of previous governments, especially nowadays in the age of artificial intelligence.

Nevertheless, the perception of infrastructure has evolved beyond being solely associated with engineers, and e-governance is now recognized as more than just a technical matter. ICTs are no longer seen as an ultimate goal, but rather as a means to achieve various objectives, including state modernization, enhanced business productivity, improved effectiveness of social policies, and the reduction of regional developmental disparities (Avgerou et al., 2005).

In fact, e-governance can be seen as a broader concept that identifies and evaluates the impacts that ICT and artificial intelligence technologies on the practice and administration of government, on relations between civil servants and society in general, and on interactions with elected representatives or external stakeholders including non-governmental organizations or private institutions. Several studies have examined how e-governance is radically transforming public sector organizations and processes (Abuljadail et al., 2023; Bovaird, 2003; Jho, 2005; Marsou & Oudri, 2023; Misuraca, 2012; Mutasa & Iyamu, 2023; Wynne, 2009). This paper seeks to investigate the ways and degree to which administrative structures and management practices have been altered by ICTs to bring about e-governance, in order to determine its challenges and implications.

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1. Origin and evolution of e-governance

The concept of e-governance emerged with the rapid advancement of ICTs in the late 20th century. The governments recognized the potential of digital technologies to streamline their actions and operations to improve public services. Admittedly, e-governance implies the use of ICT to conduct government business. But historically, and according to some authors (Schwester, 2009), the concept of e-governance started out as a way of disseminating information, then progressed to online operations in a second phase, before culminating in a participatory framework for involving citizens online. Therefore, the concept of e-governance was first conceived as a component of public administration reform, before emerging as a major social challenge and a mechanism capable not only of improving administrative services and user satisfaction, but also of promoting deeper forms of democracy (Misuraca, 2012).

In the literature on the origins of the e-governance concept, we have noted a certain confusion in previous studies between e-governance and e-government. E-government and e-governance have become key issues on the agendas of governments around the world (Jafari & Ali, 2011). Heeks (2005) for example, has proposed this definition of e-governance: "E-Governance means the use of information technology by public sector organizations or administrations". Kim (2005) had claimed that "E-Government is about the deployment of technology by government to conduct administration and to enhance the delivery of existing services, such as government/citizen platforms" (Kim, 2005a). These two definitions are very similar, but conceptually, e-governance is different from e-government (Bannister & Connolly, 2012). However, since the 1990s, the systematic adoption of ICTs in government activities was the driving force behind the concept of e-government (Bovaird, 2003; Paquet, 2000) before theoretically exploring the concept of e-governance.

Broadly speaking, e-governance is not just about the application of technology or hardware to public affairs. It also concerns how political and social authorities are structured and employed (Riley, 2004). In other words, E-Governance is about using information and communication technologies to support good governance. It has moved beyond the old models of information technology in government through the new digital connections made possible by ICT. These new connections have strengthened existing relationships and established new partnerships within society. Furthermore, e-Governance is recognized as facilitating the rapidity, transparency, accountability, efficiency, and effectiveness of processes for the performance of government activities (Bovaird, 2003; Wynne, 2009). In this way, e-governance initiatives

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support fundamental government reform agendas, and are increasingly aligned with socio-economic and development policies to enable the creation of real public value (Ojo et al., 2009), focused on transparency and accountability.

Simultaneously, and to properly study the origin and evolution of the e-governance concept, a geographical approach is also necessary. In this way, we notice that the United States has pioneered the use of ICT to modernize government operations. Initiatives such as the "E-Government Act of 2002" and the launch of the usa.gov government website paved the way for the digital transformation of government, followed by the development of e-governance. Despite the confusion between considering these initiatives under the umbrella of e-governance or e-government. the U.S. government has attempted to fully exploit the nation's technological potential previously created by major U.S. national and multinational companies (Kassen, 2015). These programs, primarily focused on systems consolidation, are the responsibility of the U.S. Office of Management and Budget. According to Chen & Hsieh (2009) several specific services have been developed, such as one-stop shops (one for business information and forms, another for geospatial data, and another for human resources and financial management).

The experience of European Union member states over the last decade reveals many changes. E-governance used to be associated with words like modernization, reorganization, access, and participation (Misuraca, 2012). In 2003, the themes of transparency, efficiency, and measurement were added. In this context, the European Commission has played a facilitating role, particularly well defined in the "European E-Government Action Plan" 2011-2015, which paves the way for the transition from e-government to a new generation of government services, governed by e-governance.

In his book *"E-governance in Africa: From theory to action",* Misuraca (2007) argues forcefully for the advantages of e-governance, particularly for local authorities in Africa. He claims that this process can enable local governments to "reinvent" themselves, and maintains that much public governance can be more easily achieved through the incorporation of networked electronic equipment and ICTs into local government administration (Misuraca, 2007). In West Africa, for example, administrations are now implementing governance mechanisms that take into account the possibilities offered by ICTs, in order to better meet the expectations of their populations. The major issue surrounding e-governance in West Africa is to improve administration through the effective circulation of administrative information, a better relationship between the administration and citizens, and above all, the availability of

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online services that help to involve the population more fully in the decision-making process that affects them (Mbengue, 2009).

Over the years, e-governance has increasingly gained popularity in emerging and developing countries, mainly in South-East Asia and India. An illustration of this can be seen in Basu's (2004) examination of the legal and infrastructure challenges associated with e-governance, particularly focusing on developing nations, with special emphasis on these countries' success in developing regulatory-related legal frameworks (Basu, 2004). Additionally, in the case of India and Southeast Asia in general, there is an active movement towards e-governance and ICT development. Nevertheless, instead of being anchored in a well-defined theoretical and practical background, e-governance is frequently perceived as a derivative of e-government. This means moving towards greater political participation and more fruitful links between non-governmental stakeholders.

In Morocco, e-governance is taking its first steps through the “Digital Morocco Plan” in 2013 and the “Digital Morocco Strategy” in 2020. Based on the recent study by Marsou & Oudri (2023), it is clear that the improvement of digital or traditional administration in Morocco is being achieved in a complementary way, by diversifying the portfolio of services to satisfy the Moroccan citizen and investing in territorial proximity as a common strategic factor that concretizes the decentralization of decision-making authority to ensure successful e-governance (Marsou & Oudri, 2023).

Constantly analyzing the evolution of the concept worldwide, Ojo et al., (2009) studied e-governance in Asia, explaining that the factors of regional competitiveness and intra-regional performance are crucial in the realization of e-governance, and their impact on the quality of governance based on the active involvement and empowerment of individuals, as well as the efficiency and effectiveness of administrative processes. In their results, a top-down regional approach is applied at scale to ensure knowledge sharing and collaborative actions enabled by communities of interest (Ojo et al., 2009).

2. Theoretical overview

Governance is a polymorphous concept (Khouya & Benabdelhadi, 2020) generating a great deal of research. Broadly, governance is frequently perceived as a question of accountability and transparency (Devaney, 2016), which require control, and control is only necessary when there are desired forms of behavior that need to be controlled (Bannister & Connolly, 2012). Governance limits also destructive and opportunistic behavior (Callens, 2022). Whereas e-

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governance has evolved into an approach that prioritizes citizens, offering them a transparent, user-friendly, expedited, and responsible interface, through an effective IT-based solution for a broad offering of administrative and public tasks and services. It is considered a high political imperative and a major component of the good governance strategy (Madon, 2009). More specifically, e-governance describes the interconnectedness between government and its wider context, encompassing political, social, and administrative spheres (Kettl, 2015). The utilization of electronic connections facilitates the interaction between the government and citizens, government and business, and the internal operations of the government to simplify and improve the democratic, governmental and commercial aspects of governance (Kettl, 2000; Palvia & Sharma, 2007).

E-governance is regarded as a significant avenue for making information technology accessible to the "Common Public" (Dwivedi & Bharti, 2010). It consists of three elements (Heeks, 2001): (1) E-administration: to improve government processes; (2) E-citizen and e-services: to connect citizens and serve them online; (3) E-society: to build interactions within and between civil society. The literature claims that e-governance is about improving the delivery of information and transactional services, encouraging active citizen participation in the political decision-making process (Ouerghi, 2016), and making government and its various institutions more accountable, transparent and efficient.

According to Ouerghi (2016), some of the main ICT contributions to e-governance include :

- Increase the efficiency of public services.
- Achieve or consolidate transparency.
- Enhance human skills and thus the ability of administrative executives to manage the national economy more effectively and more easily achieve socio-economic policy objectives.
- Improve the quality and simplicity of public services.
- Facilitate goal achievement.
- Involve stakeholders.
- Strengthen organizational confidence.

Similarly, Backus (2001) defines e-governance as the application of electronic tools to facilitate and support interaction between government and citizens. But also to adapt and update the internal workings of government with a view to simplifying and improving the democratic,

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governmental and economic aspects of governance (Backus, 2001). In this way, e-governance encompasses two interrelated dimensions. Firstly, the political dimension, which aims to empower democratic participatory processes through citizens' engagement. Secondly, the technical dimension, which concerns the optimization of government operations and processes (Bhatnagar, 2004). In the same frame, e-governance paves the way for better communication between government, business and citizens. It brings public services to citizens according to their time and place of residence, and ensures the transparency of the government service delivery system (Kumar & Suman, 2020). In this way, citizens can analyze official policies and legislation posted on the Internet, and easily access information.

To summarize all the previous points, these various areas of e-governance seem to correspond to the 3 typical interactions that characterize the governance process: G2C (between government and citizens), G2B (between government and stakeholders) and, finally G2G (between the different components of government). How is e-governance implemented? As a process, i.e. in stages. This is reflected in the various “maturity models” elaborated to assist governments in determining where they stand in terms of e-governance, according to technical, organizational and managerial skills (Grönlund et al., 2006; Madon, 2009).

Considering all the opportunities and advantages offered by e-governance as illustrated in Fig. 1, it's important to answer the question of what this technological revolution means for public management? Indeed, following this non-exhaustive overview of e-governance practices, it should be emphasized that real reflection is needed on how to overcome the challenges of ICT for good governance. To fulfill this step, we have tried to find and analyze previous studies in different contexts in order to highlight the issues and potential difficulties related to the implementation of e-governance.

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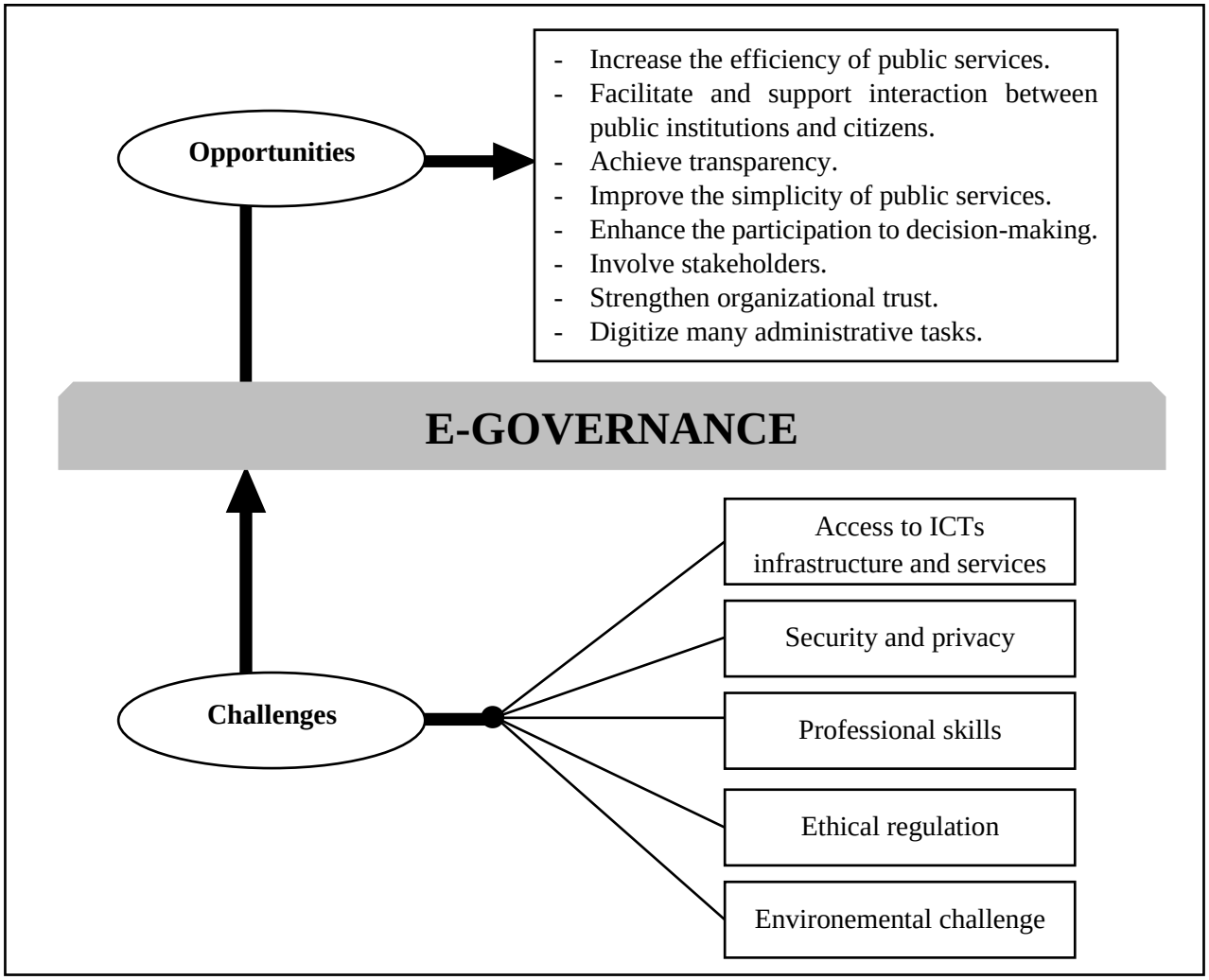
Figure 1: Framework of e-governance' opportunities and challenges



Source: Authors

3. Challenges

4.1 Access

Implementing e-governance poses several challenges (see Fig. 1). One major challenge is ensuring universal access to ICT infrastructure and service, as the digital divide can limit the access and participation of many segments of the population. As explained by Backus (2001), the principal purposes of e-governance are to improve access to information and citizens' understanding of the political process and public services, and to facilitate also the shift from passively accessing information to actively engaging citizens in decision-making (Backus, 2001).

As noted above, integrated service provision is fast becoming a crucial issue in the establishment of successful e-governance. This means incorporating certain structures and

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processes related to service provision, making them accessible to all citizens. Moreover, the implementation of integration models for online services will require a degree of cooperation between all involved actors (Lau, 2004).

4.2 Security and privacy

At the onset of the Internet, communication technology was initially regarded as a “liberating technology” due to its ability to provide individuals with a sense of privacy and unimpeded vertical channels of communication. Nevertheless, recognizing the necessity of some measure to organize the world of digital space, it has become apparent that a certain level of order is imperative. Therefore, it is unlikely that citizens and other stakeholders will use e-governance services if there is no security and privacy guarantee. The problem of security also emerges when private information is exposed for personal use or by mistake to internal or external sources (Jho, 2005). An instance of this can be observed within a platform or information system, where the database containing private information is interconnected with multiple networks, thereby significantly increasing its vulnerability to external intrusions. Moreover, internal individuals can compromise privacy by utilizing or misappropriating the database for personal objectives. In this regard, public authorities are the driving force behind the development of a culture of privacy and security. As owners and operators, and as users of systems and networks, they should be involved in shaping public policy (OECD, 2002).

We believe that this is the most serious issue that needs to be dealt with. To this end, we propose implementing robust security protocols to protect government data and citizens' personal information. This involves deploying advanced encryption techniques, multi-factor authentication, firewalls and intrusion detection systems. This requires control and monitoring mechanisms to ensure that personal data is used appropriately and in compliance with applicable laws. This can include regular audits, investigations into data breaches, and sanctions for government agencies or service providers that fail to respect security and confidentiality standards. It is also important to raise awareness among citizens and all stakeholders of the security and privacy issues associated with e-governance. Governments can conduct public awareness campaigns to explain to citizens about data privacy rights and best practices for protecting personal data online.

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4.3 Professional skills

ICTs and artificial intelligence skills are extremely important. They have become a new general skill, like the alphabet and arithmetic, and public authorities are adopting a whole range of measures to promote the acquisition of basic and advanced knowledge. This reflects the growing importance of ICT skills for employees (Lau, 2004). The challenges posed by the implementation and operation of high-technology tools also underline the need to modify the internal governance frameworks of public institutions. This will have implications for skills and human resources management in general.

The challenge of professional skills development is therefore very real. In addition, traditional management skills need to be updated and strengthened to take account of technological change. Additional skills are needed in areas such as organizational change, inter-departmental cooperation and collaboration, public-private partnerships, accountability frameworks and performance management (Lau, 2004).

4.4 Ethics

Internet governance is a crucial issue for ethical regulation of e-governance (Astier, 2005). The issue of Internet regulation and governance is undoubtedly technical, political and ethical (Berleur & Poullet, 2006). It must take a more circumspect look at the challenges it has itself initiated, which involve more than just superficial interests (Berleur, 2002). According to Massit-Folléa (2012), it is necessary to specify two opposing general conceptions of the Internet: a new space of freedom or a new instrument of control. It is by deconstructing the all-encompassing concept of governance that we can unravel the contrasts of Internet regulation, its uses, formal and informal instruments, and national public policies.

In addition, a constructive political approach is a prerequisite for successfully managing the ethical regulation of e-governance, i.e. an approach that respects its huge potential, as well as the rights and responsibilities of each stakeholder. This leads to the strengthening of transparency, democratic practices of openness and public self-organization.

In this direction, ethical regulation solutions need to be dynamic and adaptive to keep up with the technology's evolution. Ethical regulation in e-governance should be based on constant dialogue between governments, citizens, experts and industry stakeholders to ensure responsible and ethical e-governance. Governments can set up specific regulatory frameworks to oversee the use of technology in e-governance. These frameworks should include clear ethical guidelines to drive government practices, such as privacy, transparency of algorithms,

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fairness of automated decisions and protection of individuals' fundamental rights. Furthermore, international collaboration in this area is strongly recommended to develop common, or even universal, standards and guidelines in the future. This would promote a coherent, coordinated approach to ethical regulation of e-governance, and enable best practices to be shared between countries.

4.5 The environmental challenge

While institutional, professional and ethical challenges are certainly on the agenda, environmental considerations are also a major concern. It is worth considering that technological progress has a cost in terms of energy and ecology. Few studies have examined the environmental impact of ICTs. According to some authors (Flipo et al., 2007, 2016; Kuehr et al., 2003) ICTs use toxic products, either incorporated (brominated flame retardants, phthalates, hexavalent chromium or beryllium) or during their manufacture (solvents, acids, heavy metals, volatile organic compounds in particular).

4. Prospects of e-governance

As we move forward into the age of knowledge and technology, and after showcasing various opportunities, the world confronts substantial challenges of e-governance. As we have explained the emergence of the new information age, propelled by the advancement of artificial intelligence, has introduced innovative systems and practices that aim to modify, rejuvenate, and enhance public management generally, with a specific emphasis on governance. Looking ahead, the future of e-governance holds promising prospects. Advances in technologies such artificial intelligence, big data analytics and blockchain will certainly transform how government operates. The integration of emerging technologies can enhace data driven decision-making, automate routine tasks and enable personalized services.

Particularly, today's fast-moving advances in artificial intelligence technology offer governments the opportunity to revolutionize the way they deliver services and interact with citizens. AI powered systems can automate administrative tasks, streamline processes and enable faster, more efficient decision-making. Using machine learning algorithms, governments can analyze vast amounts of data to gain valuable insights, improve resource allocation and strengthen policy-making. Moreover, AI-driven virtual assistants can provide personalized assistance to citizens, answering their questions and guiding them through various administrative procedures. These technological advances have the potential to ensure people's

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right of access to information, and improve the transparency, accountability and accessibility of public administration, ultimately leading to more effective e-governance, and consequently, towards good governance.

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Conclusion

E-governance is a constantly evolving field, and new actors and initiatives continue to emerge to shape its development. Being part of the revolution of the 21st century demands more than just utilizing technology; it necessitates adopting fresh perspectives and behaviors. A more innovative logic makes it possible to intellectualize and highlight the full range of innovative technological resources, and to provide citizens with daily services anywhere and at any time, and also to monitor through these resources the respect of governance principles and practices. As a result, we would point out that e-governance requires modernizing organizations and developing new professional skills, as well as digitizing administration. E-governance means more than simply making information available on public administration websites, or developing electronic platforms. It necessitates an in-depth rethinking of how public institutions are organized and how they operate, and also transforming the mindset of employees and decision-makers to rethink the way things are done. In this regard, we sincerely wish that this paper may lead to a new dialogue for the evolution of a highly-developed e-governance that takes into account the technological context in which it is developing, day by day.

This uncontrollable technological evolution and consubstantial uncertainty imply a new complexity, and the unprecedented involvement of stakeholders can only reverberate on the notions of accountability and e-governance ethics, which are corollaries to the burden of responsibility. It's a very considerable challenge, requiring serious reflection in order to provide meaningful insights.

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