Artificial Intelligence (AI): A potential for reinventing electronic administration

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Abstract

Over time, the development of public services has undermined the emergence of e-administration by launching panoply of online digital services. Electronic administration remains a key e-Government strategy aimed at ensuring the effective management of government institutions and organizations in order to improve the efficiency and adequate delivery of services and to connect with citizens. Indeed artificial intelligence is one of the recent dimensions of electronic administration, which presents a set of specificities in the context of improving non-market relations between public administration and citizens.

The objective of this paper is to present the projects of digitalization of Moroccan public services launched by the state, to show the importance of using AI in electronic administration and its link with the quality of electronic public services, which lead to the satisfaction of Moroccan users. This report consists of proposing actions to improve online public services in order to establish a digital culture and trust in e-administration.

Keywords— Artificial intelligence, E-Government, Electronic administration, Public service, Digitalization

I. INTRODUCTION

In recent years, governments around the world have modernized their administrations and committed to electronic administration initiatives, which improve the quality of public services, transparency and accountability.

The cost-effectiveness of service delivery and government operations and the improvement of citizens' quality of life. However, technology has become central to the strategy of public administrations, and one of the key aspects of strategies in the 21st century world is e-government. This is the application of information and communication technology (ICT) to enhance administrative processes and departmental internal operations within a company [1].

In Morocco, the citizen become an influential axis of government concerns. The development of e-government is a priority for every government and one of the most crucial directions in the modernization of public administration.

The digital transformation of the Moroccan administration is a long-term process, carried out by progressive stages, aiming at the generalized access of users to dematerialized administrative procedures. His majesty the king does not cease to incite and sensitize in his royal speeches on the importance of e-government and the numerous advantages granted to Moroccan citizens.

In his speech of July 29, 2018 [1], on the reform of the administration, HM King Mohammed VI emphasized in addition to the development in the functioning of public services, the importance of adopting new technologies in the exchange of information between administrations themselves.

Indeed, Big Data, information and knowledge are fundamental concepts in our daily activities, and are the results of the digital transformation of today's global society. Smart connected products extend the physical components by adding information services and connectivity using the internet. Influenced by the transition to digitalization, many organizations are currently transforming their strategy, culture, processes and information systems to become digital and adopt artificial intelligence-based systems and services [2].

The introduction of artificial intelligence in public administration is in full swing. This technology offers many advantages and possibilities for organizations and aspires to improve the effectiveness and efficiency of services offered to citizens.

In our research, we focus on the integration of artificial intelligence as a lever for e-government and it impact of improving electronic administration services.

II. STATE OF THE ART OF DIGITALIZATION IN MOROCCO

A. Conceptual framework for digitalization

Digitalization, digital transformation, e-transformation, and digitalization: are the concepts most often used in articles to present a certainty, digitalization has become a vital concept for any organization, private or public. It integrates into all areas and saves time and energy by automating tasks that have proven to be complex in the past.

[1] https://www.maroc.ma/fr/discours-royaux/sm-le-roi-adresse-un-discours-la-nation-loccasion-de-la-fete-du-trone-0

It is also seen as a competitive advantage in certain sectors where the digital shift has not yet been fully achieved.

Most researchers agree that digital transformation is the use of technology to rebuild business processes based on customer needs. Digital transformation is a gateway to innovation and new organizational, work, and operating models. According to Mignot [3], digital transformation is the integration of digital technology into all levels of the organization in order to change the way it operates and bring value to its customers.

However, based on the scientific articles on the same subject, there is an ambiguity between the terms "digitalization" and "digitization", as proved by Varenne [4]. This last one tried to compare the two concepts: Since 1990, digitization has been about archiving and storing documents in a digital format and then reusing those documents in an Enterprise Resource Planning (ERP) or an Electronic Document Management. While digitalization is characterized by the transformation of the organization and its digital maturity, which allows it to transform its business model."

Gartner [2] explains digitalization as the use of ICT to transform the organizational model and to bring new opportunities for creating value from increasing revenues; it is a process of transformation towards a digital organization.

According to this, the idea revolves around two major challenges of the digitalization of administrations: on the one hand, the use of new technologies by administrations to get closer to users and integrate them into administrative processes stakeholders, and on the other hand, ensuring the effectiveness and efficiency of public services through the modernization of administrations.

B. Morocco's digital strategies

Since 1996, Morocco has been involved in the restructuring of the ICT sector through the adoption of Law no. 24-96, which made it possible to take the first step towards liberalizing the telecommunications sector. In this regard, Morocco has adopted several digital strategies. A five-year plan from 1999 to 2003, e-Morocco 2010 from 2005 to 2010, and an MN2013 strategy for the period 2009 to 2013.

After «Maroc Numérique 2013», Morocco has launched a new digital development plan «Maroc Digital 2020» for the years 2013 to 2020, with a view to further boost the sector of the digital economy. In this plan, three pillars have been proven[3] [5].

- Digital Transformation of Administration (E-administration).
- The implementation of a strategy for digital transformation of the national economy through the abatement of the digital divide for the benefit of citizens (connectivity for all, primary, secondary, and higher education programs, public WIFI acess) and businesses, including Small and Medium Enterprises / Very Small Enterprises (SME / VSE) (regions disadvantaged in connectivity).
- Integrated transformation of important sectors of the economy (PortNet, Health).

The Digital Development Agency (ADD), was created in 2017 as a catalyst for Morocco's digital transformation, The ADD's main mission is the implementation, of the State's strategy for digital development by 2025, which based on these reflections. It defines Morocco's digital development prospects with three major challenges: improving the quality of public services, improving the productivity and competitiveness of the national economy, and reducing social inequalities [6].

Therefore, to accelerate the digital transformation, ADD set the goals to be achieved by 2025:

- A digital administration that serves citizens and organizations by increasing their satisfaction rates and reducing the rate of interaction with public administrations.
- A competitive and efficient economy in a digital and innovative ecosystem, through the installation of a network of 2,500 startups.
- Inclusive society through digital, health, and education.

The agency also aims to contribute to the launch of an Ecosystem IA program for research on artificial intelligence themes. It is based on sectoral use cases, with the objective of coordinating around the research topic that targets and customers, private and public training organizations, and innovative start-ups. This project aims to create an AI Ecosystem on the Natural Language Processing and Natural Language Generation streams for digital inclusion with a conversational AI engine.

III. THE DIGITIZATION OF PUBLIC ADMINISTRATIONS

The concept of electronic administration appeared between 1990 and 2000. It is known under different designations: E-administration or E-government [5]. The Organization for Economic Co-operation and Development [6] defines electronic administration as "the use of information and communication technologies to improve the efficiency of the administration and the level of services it provides, in particular via the Internet".

A. Electronic Administration: Generalities

Electronic administration is the use of ICT to improve the administrative performance and internal functioning of public services. It is based on different types of management work, such as internal routines, digitalization of administrative tasks and the creation of strategic links between departments [7].

The resulting benefits are reducing corruption, increasing transparency, more comforting, increasing revenue and reducing costs.

Indeed, in order to reap the benefits of digitalization and make public administration more effective, kinder, more efficient, more transparent, and accessible to users, the state

[2] American consulting and research company in the field of advanced techniques.
[3] https://en.unesco.org/creativity/policy-monitoring-platform/strategie-maroc-digital-2020

must constitute plans for reform, modernization factors that seek to change administrative procedures extremely, and the quality of public services provided to citizens. The evolution of ICT will allow significant progress in terms of simplification and quality of services provided to users and in reforming the administration itself.

In this wake, e-government is part of dynamic economic development of knowledge and the introduction of new ICTs into all segments of people's daily lives. In this sense, IT is an essential vehicle for modernizing and reforming the public sector with the aim of more efficient administration, bringing it closer to users, and restoring citizens' confidence in the use of the Internet to provide high-value-added services. To carry out this project, e-government aims to put users at the center of management concerns and to demonstrate a quality service with transparency.

In addition to the online availability of administrative services, e-administration must also be the opportunity to thoroughly modernize structures, to deploy the tools for increased exchange and work, but also, above all, to allow the different directorates to interoperate so that e-administration is not a purpose but a means of rendering a service to the public.

Therefore, certain actions are necessary to improve the service provided to users:

- Simplify administrative procedures;
- Offer original and innovative services;
- Improve the reception and sense of caring for citizens in public services (reduction of waiting times, one stop shop, handling of complaints);
- Improve access to services by developing platforms;
- Establish a barometer on the effectiveness of public services;
- Supported the principles of transparency, accountability, and governance;

The improvement of digital administrative services requires a greater openness of mind by those in charge of users and a greater speed of action. It would therefore be wise deploy listening devices, to reinforce proximity, and adapt the provision of services to the different social and geographical situations of citizens in order to make access to services equitable.

B. The reinvention of electronic administration in Morocco

The last decade has known a digital revolution that challenges states and has led to radical changes in many sectors around the world, while Morocco is not part of this revolution. The Ministry of Public Service has qualified this strategic choice as it and Administrative Reform will allow our country to reduce the cost of public services, bring them closer to citizens, and modernize public administration [4] [10].

In this context, in an interconnected world, speed, efficiency, and effectiveness are the keys to competitiveness. In order to win the digital race, the Moroccan administration must simplify the digital landscape to ensure perfect visibility for the public. In addition, the effectiveness of services provided and their functioning, also to facilitate access to daily services for citizens and businesses, to protect citizens' private information and inform them in order to improve the channels for listening to and handling complaints.

With the aim of simplifying access to its services, the Moroccan administration has put in place a variety of digital communication tools long before COVID19 would be a global anxiety. These tools have been very important because they have allowed citizens to send their papers and to follow their files without moving, without resorting to any institution, and especially without problems of confrontation with another person.

Thus, since the declaration of the health emergency in Morocco, most administrations have favored and sometimes demanded the exchange of online documents to face the pandemic and to guarantee the stability and continuity of state services with the consideration of health measures.

Here are some electronic services for the public:

- Service-public.ma: Guide to Administrative Procedures.
- chikaya.ma: management of complaints and user observations
- passeport.ma: biometric passport
- rokhas.ma: management of planning authorizations and economic authorizations.
- casierjudiciaire.justice.gov.ma: Request for an extract from a criminal record
- cnie.ma: Electronic National Identity Card
- eparapheur.gov.ma: validation of electronic documents
- consulat.ma: e-Consulate
- watiqa.ma: Electronic window for ordering administrative documents
- rcar.ma: Management of public and private pensions
- bodigital.gov.ma: Digital order desk
- ompic.org.ma: Online trade register
- badr.douane.gov.ma: Customs services

Note that some national police and customs services, the Central Bank of the Kingdom, the Directorate of Taxes or communal services, are all cases of use of AI, which could soon emerge in all Moroccan administrations. On the one hand, supporting AI in these applications will relieve managers of repetitive tasks where humans are often less good and less effective than AI.

However, the President of the Economic, Social, and Environmental Council (EESC), Ahmed Reda Chamia, stresses that the various initiatives launched and appropriate efforts made are clearly insufficient to guarantee the preconditions for a successful digital transformation and to reduce the digital patent divide that the Covid-19 crisis has only exacerbated. A number of fragilities and weaknesses could explain this situation, including the delay in implementing previous digital transformation policies in multiple sectors such as administration, health, education,

[4] https://uclgafrica-alga.org/wp-content/uploads/2019/05/unpan002395.pdf

and industry, as well as the fragmented and sometimes inadequate legislative and regulatory frameworks, in particular, in the following aspects of teleworking, low geographic coverage of broadband and ultra-broadband Internet infrastructure[5].

The board president explained, "This could ultimately save around 718 million hours of work per year, or about 1% of GDP (over 10 billion dirhams), due to the productivity and efficiency gains brought by dematerialization.

He stressed that it is also a problem that the ICT sector contributes more than 10% of GDP and launches at least one Moroccan unicorn in the field of artificial intelligence, fintech or agtech within five years.

To this end, Morocco has made remarkable progress in the digitalization of public services, with the aim of concretizing the principles of a qualified, transparent, and fair local administration.

Although these electronic administrative services are established, we question the application of marketing principles in the launch of these digital products as well as user training. The launch of a product, whether by a company or by a public administration, requires the consideration of at least two fundamental components: the quality of the product launched, and the good communication to push people to use it. In other words, marketing is not an exclusive domain of private companies the offer of public administrations has a marketing particularity where the quality of the proposed service is paramount [8].

IV. ARTIFICIAL INTELLIGENCE-BASED ADMINISTRATION: A FRESH AND CRUCIAL TOPIC

Technological advances, new information technologies, business intelligence, the modernization of public services, and the use of artificial intelligence are all current topics, projects and challenges that can reshape the administrative landscape. Ensure that, it meets the daily expectations of citizens, and businesses that rely on the best services provided by digital technology in an effective and efficient manner.

A. Definition of Artificial Intelligence (AI) and Robotics

a. Definition of artificial intelligence

Various definitions of artificial intelligence (AI) have emerged over the past few decades Technological advances and human perceptions of what intelligent machine action is before 20 years, can now be considered very rudimentary given the technical advances made (Task Force IA, 2019)[6] [12]. However, AI can be defined as the ability of machines to reproduce human behavior such as thinking, learning, planning and creativity [9][7] [13].

Based on the literature, we have noticed many times that researchers confuse robotics with artificial intelligence. However, is it the same? The answer is no. Robotics is part of artificial intelligence, and there are two kinds of robots [14]:[8] Robotics is part of artificial intelligence in which we can distinguish two types of robots. The first type seen daily in industrial companies performing repetitive tasks, are programmable machines capable of performing a series of actions autonomously or autonomous, and the second type is the type of robots that are based on artificial intelligence and it is able to think and make decisions like the famous humanoid inferior « Sophia »[9] [15].

In short, AI is “an autonomous system that can perform complex tasks previously thought to be reserved for natural intelligence”. It processes large amounts of information, performs calculations and predictions, learns and responds, adapts to changing circumstances, and recognizes and classifies objects [10].

b. Types of artificial intelligence

According to J.C. Heudin [11], it is necessary to distinguish between two types of artificial intelligence according to the capabilities of the tasks envisaged: narrow AI and general AI. Narrow is that of the present systems, it shows high performance, often equal or superior to those of human beings, but in restricted domains well defined as (image recognition, games, diagnosis, identification of speech, etc.) for which precise learning has been conducted.

The AI General is similar to a human being, having the ability to understand and reason about various topics and rely on the experience gained. It is also able to learn driving complex tasks in different areas. The basic components are self-awareness and emotions. Research on strong AI in laboratories is ongoing and it is very difficult to say when it will emerge... (J.C. Heudin, 2021).

For Jean-Claude Heudin[10], we can also distinguish between three types of AI, divided into six levels, four of which have been and two not yet[11] :

i. Weak artificial intelligence:
   - Inferior to human ability, it is used for specific tasks (example: voice recognition, chat boots, and virtual assistant).
   - Similar to humans but just for specific tasks (example: expert systems, classification of objects, images...).

ii. Average artificial intelligence:
   - Superior to most human intelligence for specific tasks (example: the new world chess champion 'Deep Blue').
   - Superior to any human intelligence, for specific tasks (example: Alpha GO: the first program to win Ke Jie the world champion of the game of Go).

iii. Strong artificial intelligence (Until 2022 not yet deployed):

[5] https://www.ecoactu.ma/intelligence-artificielle-transformation-digitale-cese/
[6] https://www.defense.gouv.fr/sites/default/files/aid/20200108-NP-Rapport%20de%20la%20Task%20Force%20IA%20Septembre.pdf
[7] https://www.europarl.europa.eu/doceo/document/TA-9-2020-0275_FR.pdf
[8] https://robotsmali.org/fr/quelle-est-la-difference-entre-la-robotique-et-lintelligence-artificielle/
[9] https://www.neozone.org/robotique/sophia-robot-humanoide-social-bientot-commercialise-serie/
[10] French scientist specialized in artificial intelligence and deep learning
[11] https://www.iim.fr/lintelligence-artificielle-enjeu-lemploi/

- Superior to human intelligence for a majority of tasks
- Extreme artificial intelligence

B. *The crucial role of artificial intelligence in public administration*

"AI will make life easier for citizens, modernize public administration and services, improve participation in public life and foster economic development through better availability and easy sharing of information... As well as AI will also improve information technology and the persistence of a digital economy, overcome the hesitations that may exist within the administration..." said the Minister Delegate for the Reform of Administration and the Public Service, Mohamed Benabdelkader[12] [18].

The proliferation of artificial intelligence (AI) technologies has potential benefits not only for public services but also for other sectors. More precisely, AI has the potential to improve the relationship between public administration and users [12]. This relationship is based on four aspects: ensuring the security of the deployment process (control), reducing costs (cost), adapting to the needs of users (convenience) and strengthening the link between public administration and users (connection), in the expansion of the already observed favors of e-government for public service [13].

AI can improve use cases for managing the relationship between citizens and administration by automating answers to questions (e.g. chatbot), intelligent and immediate information retrieval (e.g. for automatic form filling, etc.), managing routine queries (e.g. automatic request routing), eliminating recurring tasks, doing translations or to writing custom and automated answers [14]. In general, research on AI in the public sector affects all areas of public administration, although it is still flourishing [15].[13]

At the same time, there is a risk of deviations that must be foreseen and managed to guarantee the development of reliable AI in order to put humans at the center of interest [16] [14] . Therefore, special attention should be given to automated decisions that may affect the lives of citizens. In particular, the digital evolution in Morocco and especially the electronic administration already brings risks of neglecting the users' educational capacity and the appearance of a social disparity between the populations at the level of ICT use[15] and should not be aggravated by AI [24].

A study by [17] of three Quebec public organizations found that the integration of AI solutions into public organizations led to remarkable changes in relationships between colleagues and in work organization. With AI tools, managers no longer need to focus on this monitoring task or evaluate the work of employees. This allows the middle management role to evolve and place more emphasis on the relational aspect with the employee, to help correct errors quickly. The relational aspect takes precedence over surveillance tasks, as they no longer need indicators to evaluate the work of employees, however are now provided by artificial intelligence systems. This can improve communication skills between managers and employees. In this new work environment, managers' communication skills are very important for interacting with team members, supervising them, and coaching them (coaches).

For all these reasons, it is important to adopt an e-government equipped with artificial intelligence in public services based on a proven theoretical framework for the adoption of innovation.

C. *Factors supporting the development of electronic administration*

Artificial intelligence (AI) is one of the major advances in the last decade. It offers today, above all to public administrations good practices. The wave of robotics creates key opportunities to solve problems, changes in use and a lot of fear. Between fantasies, hopes, and worries. It is in this context, its deployment in the public administration must bring regulatory and strategic aspects.

- Implementation of legislative rules organizes electronic administration and strengthens the texts relating to data governance, and especially open data etc. This last point is one of the key levers of digital transformation in a country and an important element in building trust between citizens and their administrations. It also allows the creation of innovative ecosystems around data across the territory [18][16].
- In addition, electronic administration must be promoted through an integrated approach that allows for common access to information by different departments and services. (HM King Mohammed VI, 14 October 2016)[17] [26].
- Invest heavily in new technologies from kindergarten onwards, whether in terms of teaching technologies or subjects to teach, by introducing young apprentices to the world of digital, artificial intelligence, and robotics.
- Create a digital culture within public administration and citizens through awareness raising, education through media and training.
- Each public administration must have its own coherent and well-identified digital strategy, through the implementation of a real action plan for the development of new skills within the teams, especially those directly attached to the IT department and the human resources managers.

[12] https://maroc-diplomatique.net/lintelligence-artificielle-une-opportunite-pour-lamelioration-du-service-public/

[13] http://actions.trends.levif.be/actions/trends/publicsector/ducoteduprive2.jsp

[14] https://futurium.ec.europa.eu/en/european-ai-alliance/pages/altai-assessment-list-trustworthy-artificial-intelligence

[15] http://www.omap.ma/userfiles/files/Rencontres/Actes-de-la-journee-d-etude-L-administration-electronique-au-Maroc-Realite-et-perspectives-04-07-2019.pdf

[16] https://add.gov.ma/storage/pdf/Avril_NOG_ADD_fr_SITE_VF.pdf

[17] https://www.mmsp.gov.ma/fr/actualites/circulaire-du-chef-du-gouvernement-n-%C2%B0-202020-relative-%C3%A0-la-mise-en-%C5%93uvre-des-dispositions-de-la-loi-n-%C2%B0-5519-relative-%C3%A0-la-simplification-des-proc%C3%A9dures-et-formalit%C3%A9s-administratives

Morocco's tendentious commitment to a digital connectivity model presupposes the development of administrative ethics and the appearance of a specific project for the organization and its activities. This ethic places collaboration, exchange, sharing, and communication as catalysts for administrative functioning. This also implies that the administration is involved in the dynamics of sharing resources with external operators with specific interests. This appears strongly with an administration that acts in the general interest and retains control over all computer data design, production, and distribution processes to protect them and preserve the public interest.

Finally, most administrations have been digitized; so the challenge now is not the digitalization itself but to transform the existing taking into account the more practical and innovative possibilities. The centralization of data (project currently running for some administration), geolocation, exploitation of large volumes of digital data (an approach called big data), integration of decision support tools (business intelligence), portability, secure and fast data exchange, interoperability, mobility…. etc.

CONCLUSION

The digital transformation of administration, public services, and government agencies is now a top priority for all governments around the world.

To sum up, it is clear that digitalization is not a fashionable thing but has become a fundamental obligation for the development of ecosystems. That is why Morocco must review, reorient, and reconsider the obstacles and inadequacies that have emerged in previous development models and build a new development model better suited to global technological progress based on automation and artificial intelligence. Admittedly, the Covid19 crisis is seen as an opportunity, especially a challenge, to draw lessons for the world in the digitization of public services. It is also an opportunity to change mindsets and adopt more perspectives: globalization of skills and qualifications.

However, Jean-Claude Heudin says that artificial intelligence does not replace man but increases his intelligence, forming a kind of "third hemisphere".

The aim of this work is to highlight the importance of thinking and integrating AI into public electronic administration in Morocco. This administration must meet the needs of citizens and ensure good functioning. Thus, it must also respond to political, social, and economic conditions fundamental to the advancement of the state and the well-being of citizens. As a result, the failure of its functioning can create enormous obstacles with direct impacts on development.

Morocco has great potential to be one of the major digital actors in Africa. As early as 2005, it adopted the e-Morocco 2010 strategy, followed by the Digital Morocco 2013 plan, Digital Morocco 2020, and Horizon 2025. In 2020, the digital transformation provided Morocco with the opportunity to position itself as an African Digital Hub and took fourth place in the «Digital Risers» in the competitiveness of MENA countries in terms of digital.

On the other hand, in order for Morocco to achieve its goals, it is necessary to adopt new management styles that put the citizen or user at the center of the action, and that allow for structural changes in the organizational culture within public administrations. In this sense, several interesting research avenues remain to be explored.

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