ABSTRACT:
Digital maturity refers to the level of development and competence of an organization or company in the use and exploitation of digital technologies to achieve its strategic objectives. It implies a thorough understanding and effective use of digital tools, processes and skills to drive innovation, improve operational efficiency, optimize the customer experience and maintain competitive advantage.

In light of the present circumstances and the growing prevalence of new technologies, elevating the level of digitalization is the most advantageous decision for every organization. This research paper, serving as a state-of-the-art study, delves into the examination of the digital maturity of both private and public organizations in Morocco. The primary objective is to assess their preparedness for digital transformation and their potential for success. The findings indicate that although weaknesses are apparent, the private sector is notably more advanced compared to public administrations. Consequently, there is a clear impetus for aligning the practices of public administration with digital advancements, aiming to expedite and streamline administrative processes while fostering collaboration between the two sectors.

Key words : digital maturity, digitalization, maturity models, digital transformation

RESUME :
La maturité numérique désigne le niveau de développement et de compétence d’une organisation ou d’une entreprise dans l’utilisation et l’exploitation des technologies numériques pour atteindre ses objectifs stratégiques. Elle implique une compréhension approfondie et une utilisation efficace des outils, processus et compétences numériques pour stimuler l’innovation, améliorer l’efficacité opérationnelle, optimiser l’expérience client et maintenir un avantage concurrentiel.

À la lumière des circonstances actuelles et de la prévalence croissante des nouvelles technologies, élever le niveau de numérisation est la décision la plus avantageuse pour chaque organisation. Ce document de recherche, qui constitue une étude de pointe, se penche sur l’examen de la maturité numérique des organisations privées et publiques au Maroc. L’objectif principal est d’évaluer leur préparation à la transformation numérique et leur potentiel de réussite. Les résultats indiquent que, bien que des faiblesses soient apparentes, le secteur privé est nettement plus avancé que les administrations publiques. Par conséquent, il y a un élan clair pour aligner les pratiques de l’administration publique avec les avancées numériques, visant à accélérer et à rationaliser les processus administratifs tout en encourageant la collaboration entre les deux secteurs.

Mots clés : maturité numérique, numérisation, modèles de maturité, transformation numérique.
Digital transformation has become essential to a company's survival. We recall the case of NOKIA, a leading cell phone company with almost half the market share in 2007. However, the main reasons for Nokia's decline include a pervasive bureaucracy leading to an inability to act, destructive internal competition and a failure to realize the importance of lifestyle products like the iPhone. The example of this company is often cited as an illustration of what happens when a company takes too long to engage in change management and ignores market transformation. This new situation requires the company to develop the necessary tools to adapt to a hyper-connected world.

This race to digitalize the organization is driven by three main factors. The first is to improve the customer experience. Indeed, transforming the customer experience is at the heart of digital transformation. A pleasant, error-free customer experience generates value for both customers and the brand. In a survey carried out by the MIT Center for Digital Business and Capgemini Consulting on 150 executives, 70% cited the relentless rise in customer demands as one of the primary drivers of change. The second factor is the ongoing quest for standardization, which makes automation possible. It makes work more efficient and safer without cutting jobs. Indeed, standardization entails risks of deskilling and loss of autonomy for employees. But it can give them the freedom to perform more rewarding tasks. Finally, the third factor in the adoption of Digital Transformation is the quest for operational process efficiency and cost reduction. Indeed, the benefits of digitalization go far beyond lower labor costs. They also include opportunities to increase volumes, improve quality, enhance safety and protect the environment. Recent technologies also provide new ways of controlling the risk of fraud. Although digital is of considerable value in controlling process variation and reducing fraud, it is no less useful for stimulating innovation. Standards and processes that reduce drift can also serve as a trigger for experiments that improve results.

Most companies embark on a digital transformation process without first preparing a strategy tailored to their business, market or economic and social context. Similarly, many organizations are starting to invest in digital technology without know exactly what impact digitalization will have on their business, workforce or environment.

Actually, digital transformation involves much more than simply implementing new technological tools. It simultaneously affects several areas of an organization, and several entities need to be involved in this transformation. All these entities need a common, coherent understanding of the relevant areas to be addressed and the prioritization of actions taken to digitize the organization.

Consequently, the need to systematically assess the overall state of digital transformation and chart an effective path towards a desirable future state of digital maturity is growing considerably in any type of organization. Digital maturity is important for all organizations, especially companies, as it has been proven that companies with a high level of maturity outperform their competitors in their sector in various dimensions of financial performance.

Digital maturity refers to an organization's ability to make effective use of digital technologies to achieve its objectives and meet the needs of its market. Several levers can be used to improve digital maturity, such as a culture of innovation, employee training, the implementation of an appropriate technological infrastructure, and effective communication with customers and partners.

1 David J. Cord, (2014)
2 Océane Mignot, Maxima, (2019)
3 La phase 1 de cette étude pluriannuelle est une enquête exploratoire impliquant 157 entretiens avec des cadres 50 entreprises dans 15 pays (54% en Europe, 30% en Amérique, 16% en Asie), MIT Center for Digital Business and Capgemini Consulting, 2011
4 G. Westerman et al. (2014)
5 Michaël Tartar et David Fayon, (2019)
6 Berghaus et Back (2016)
7 G. Westerman et al. (2014)
8 Michaël Tartar et David Fayon, (2019)
In this article, we will first discover the different aspects of digital maturity and the levers that can be used to reinforce it. Then, we will explore, in the light of studies conducted by Moroccan institutions, the practices of Moroccan private and public organizations and their level of digital maturity.

II - DEVELOPPEMENT

2.1. Defining and measuring digital maturity

The term "maturity" refers to a state of being complete, perfect or ready. It is the result of progress in the development of a system. Maturing organizations improve their capabilities over time towards the realization of a targeted future state. Sometimes digital transformation and digital maturity are used interchangeably, without considering the differences. However, digital maturity can be seen more as a systemic means of digital transformation. Thus, digital maturity describes what an organization already achieved in terms of transformation efforts, and how that organization is systematically preparing to adapt to an increasingly digital environment in order to remain competitive.

Digital maturity goes far beyond a simple technological interpretation that simply reflects the extent to which an organization executes tasks and manages information flows through IT, but also reflects a managerial interpretation describing what a company has already achieved in terms of digital transformation efforts, including changes in products, services, processes, skills, culture and capabilities concerning the mastery of change processes. In this way, digital maturity includes both technological and managerial aspects, and can therefore be seen as a holistic concept. Organizations reach the highest level of maturity when they have both a solid digital foundation and a good understanding of how to leverage this foundation for strategic business advantage. Furthermore, digital maturity is not a static concept, as the digital landscape is constantly evolving. So, an organization will need to assess its maturity over time.

The digital transformation process can be approached in very different ways, depending on a company's structure, the nature of its business and its environment. So, as a decision-maker or manager, it's essential to have the tools to clarify the current situation objectives and prioritize appropriate projects. Hence the introduction of several digital maturity diagnostic models dedicated to different types of organizations (public, private, SMEs, VSEs, etc.). A maturity model provides indications of the way in which organizations are approaching their digital transformation, and maps out typical paths for how they carry out their transformation.

Maturity models can be seen as a tool that primarily assesses the status quo and indicates a potential, anticipated or typical development path towards the desired target state. Digital maturity models help organizations assess their ability to cope with digital transformation along predefined dimensions. Particularly in the case of transformation they can help to understand the current state and capabilities of an organization to effectively and systematically manage and guide digital transformation efforts. Digital maturity models consist of dimensions and criteria that describe areas of action and measures at different levels that indicate the evolutionary path towards maturity.

A dimension is a specific, measurable and independent component that reflects a major, fundamental and distinct aspect of digital maturity, and describes a field of action. The definition of the term "maturity

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9 Lahrmann et al. (2011)
10 Kane et al. (2017)
11 Teichert (2019)
12 Michaël Tarrar et David Fayon, (2019)
13 Shahiduzzaman et al. (2017)
14 Ibidem.
15 Berghaus et Back (2016)
16 Becker et al. (2009)
17 Berghaus et Back (2016)
18 De Bruin et al. (2005)
level" can be linked to the capability maturity model. In this context, a maturity level consists of specific and associated generic practices for a predefined set of maturity dimensions that can improve the overall maturity of the organization. An organization's maturity level provides a means of characterizing its performance, and can be defined as an evolutionary plateau for improving organizational maturity. The terms "maturity stage" and "maturity level" can be used interchangeably19.

According to Roman Teichert's (2019) systematic literature review, the first studies on digital maturity were published in 2011 and 2012. Both studies were developed by a practitioner (Friedrich et al., 2011; Westermann et al., 2012). The first study measured the digitalization of industry in 15 different industrial sectors and different business process dimensions. The MIT/Capgemini study described a digital transformation maturity model that distinguishes between "digital intensity" and "digital transformation intensity", and defined 4 archetypes reflecting different levels of digital maturity20. This study underlined that, in addition to IT capabilities, transformation capabilities are also necessary for a successful digital transformation. Prior to 2015, practitioners dominated this area of digital maturity model development. However, since 2016, academics have begun to draw attention to this area of research, and since then, nearly 70% of the included studies have come from academics21.

Despite the multiplicity of models, the basis of each is oriented towards six relevant areas: corporate strategy, the societal and cultural dimension (acceptance by staff and the organization), the relationship with the customer, the technology used and the operations carried out to control the environment22.

- Strategy: to achieve digital maturity, the organization must develop a strategy that integrates digital technology as a structural component23. A strategy adapted to the digital age is one that exploits the potential offered by digital technologies to improve performance and expand business.

- Organization: traditional organizational models, such as the vertical hierarchical model, are ill-suited to the ever-changing digital environment. In the context of digital transformation, management involvement is essential to adopt a new organizational culture and develop the necessary responsiveness and agility.

- Human capital: the degree of staff preparation, commitment, motivation and participation in digital transformation remain key factors in achieving digital maturity. On the contrary, if not mastered by all employees, technologies will be a brake on the organization's development.

- Offer: The digital context requires organizations to develop personalized, scalable and rapidly adaptable offers to meet the needs of customers who are better informed, less loyal to brands and attentive to brand reputation on the Internet, particularly on social media. The transformation of the customer experience, which starts from the identification of the need right through to delivery, is at the heart of the digital transformation of organizations. Indeed, a customer who has had a smooth, pleasant and positive shopping experience is more likely to remain loyal to the brand, or even become a brand ambassador. On the other hand, if a customer is dissatisfied, in addition to being a lost customer, he will talk about his experience to everyone around him, including on social networks, thus negatively impacting the company's sales and e-reputation.

- Technology and innovation: technology is the key driver of digital transformation. To achieve digital maturity, organizations must be able to make intelligent choices in terms of technical solutions, and modernize their digital infrastructure without compromising security.

- Environment: to make a success of its digital transformation, the organization needs to master its environment by adopting an open, watchful approach in order to cope with a constantly changing economic, social, legal and technological context.

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19 Teichert (2019)
20 Ibidem.
21 Teichert (2019)
22 Michaël Tartar et David Fayon, (2019)
2.2. Analysis of Digital maturity of Moroccan organizations:

Assessing digital maturity involves taking stock of the current situation, gaining a better understanding of the dynamics of digitalization, and determining the ability of Moroccan organizations to respond effectively to the changes imposed by this transformation24.

Diagnosing the digital maturity of Moroccan organizations represents a first approach to assessing the level of digitalization of Moroccan structures and the country's progress in the digital transformation process. Several studies have been carried out in this area by national institutions, namely the survey published by the Royal Institute for Strategic Studies (IRES) in 2017 and another by the Association of Information Systems Users (AUSIM) in 2021. The first survey attempted to assess the maturity of Moroccan private and public organizations on the basis of data gathered from 28 companies and 6 central administrations. Admittedly, this study is not necessarily representative, but it does enable us to form an initial assessment of the level of readiness of major Moroccan operators for digital transformation. However, the AUSIM survey is representative of all business sectors, with 67 institutions represented and 71 respondents. Half of the organizations surveyed are SMEs, compared with a third representing large national groups and 9% dedicated to public organizations. According to the report, which is published in September 2021, one of the objectives of this study is to measure the digital acculturation and maturity of public and private operators in Morocco. For its part, the Ministry of Administration Reform and Civil Service has launched a supply-side maturity assessment study in 2019. This involves a survey of 87 administrations, including 35 ministerial departments and high commissions (100% coverage) and 52 public establishments and companies (30% coverage), to map e-services, assess their maturity and help administrations identify areas for improvement.

On the basis of these studies, we have drawn up an inventory of the digital maturity of Moroccan private and public organizations, organizing the findings according to the six main levers detailed above.

2.2.1. Digital maturity of private sector organizations in Morocco:

a. Strategy:

According to AUSIM, digitalization is anchored in the minds of almost all respondents as a major performance lever. 82% of companies are currently carrying out a digital transformation, and 62% have already deployed their digital strategy by transforming one or more processes or functions. However, the lack of a strategic vision and formalized roadmap is the most cited obstacle to successfully completing the transformation project. This finding was revealed by the IRES study, which confirmed that for 40% of companies surveyed, digital represents "one chapter" of the company's overall strategy. On the other hand, 60% of companies have succeeded in adopting digital as an integral component of their overall strategy, with 15% (mainly subsidiaries of major international groups) having already integrated it as a structural component fully rooted in corporate strategy. The results show that Moroccan companies need to make a greater effort to integrate digital opportunities into their business models, and to move up the digital maturity ladder.

b. Organization:

This dimension is essential, as it reflects the mode of governance adopted and the degree of involvement of top management in the digital transformation process, which is a requirement for successful digital transformation.

In this sense, the IRES survey revealed that almost 40% of the companies questioned declared that they had structured, transformational governance at an advanced stage. This means that the digital agenda, in both its strategic and operational aspects, is steered directly by senior management. The rest of the companies are either in an experimental phase, with general management involved in specific projects, or in the process of structuring, with management involvement in the organization's key projects. Only 3% of companies

\[24\text{ AUSIM (2021)}\]
declare that they have no specific governance in place for digital transformation. These results put Moroccan companies on the right track towards digitalization.

c. Human capital:

According to the IRES survey, for almost half of all companies, digital culture is in the process of being rolled out to all staff. 1 in 5 of the companies in the sample consider that they have succeeded in deploying a digital culture among their staff and fully dematerializing their processes. Only 7% of companies still have a minority digital culture.

The study carried out by AUSIM complements these results, highlighting that the majority of respondents claim that the environment is conducive to initiative-taking and new ideas. However, it should be noted that lack of ownership represents a major challenge in half of all cases. Also, in 21% of companies, it's the lack of digital acculturation that hinders the digitization process. Without common consent and a digital culture shared by all company staff, it is difficult to translate a digital transformation strategy onto the ground.

To overcome these challenges, Moroccan companies are urged not only to continue spreading the digital culture among their staff, but also to develop mastery of digital tools and the appropriate skills for each type of work.

d. Offer:

The "offer" dimension reflects the degree to which Moroccan companies have integrated digital tools to develop innovative goods, services and customer interfaces. On this dimension, according to IRES, the majority of companies (71%) are positioning themselves as emerging and are beginning to integrate the customer experience as a key component of value creation. This observation is also confirmed by AUSIM, which found that the digitization of customer relations is not a widespread success for all Moroccan companies. A further 40% of respondents stated that their sales force lacked digital tools. Studies have shown that Moroccan companies focus on the basics, such as social networking and website creation. Transactional services, fully digitized customer experiences and reactive, predictive use of data are all areas in which Moroccan companies still need to improve in order to reach an advanced level of digital maturity.

However, the digitalization of a company’s offering cannot be limited to an external transformation, but is conditional on the successful dematerialization and automation of internal processes such as accounting, finance and operations. The more internal, repetitive and high-volume operations are digitized, the fewer incidents with the external environment will occur, which is seen as a driver of productivity and cost reduction.

In this area, Moroccan companies are lagging behind, with half of respondents reporting the absence of an ERP package, which is essential for good business management. The AUSIM study shows that less than a third of operators have succeeded in dematerializing all supplier, customer and employee processes. For the rest, the risk is far-reaching, since embarking on a digital transformation with a flawed operating model put at risk the customer experience rather than making it a success.

e. Technology and Innovation:

On this axis, the studies focused on Cloud practices, connectivity and data exploitation, which are essential to digital innovation.

The IRES study highlighted the fact that Moroccan companies are still emerging or in transition in this area. In other words, the use of Big Data has been initiated or deployed for certain projects. Cloud computing, on the other hand, is seen as an option and is currently being tested. Only 18% of respondents consider data as a digital asset and the Cloud as a routine practice within their organizations. Most of these are subsidiaries of large international groups. This approach is counter-productive and at odds with the spirit of digital, which is based on the adoption of flexible, agile and less costly tools.

These strategic technology choices have a direct impact on innovation. AUSIM revealed that Moroccan companies have no shortage of initiatives and new ideas for digitalizing their businesses. However, to turn
these ideas into reality, companies need to adopt the right methods and tools to align themselves with customer needs. Companies also need to learn to accept uncertainty and opt for the "test and learn" approach, which involves taking action and encouraging dynamism by testing new digital solutions, analyzing the results and making adjustments as they come along.

f. Environment:
AUSIM studied the technological debt of Moroccan companies, revealing that over 80% of the structures surveyed have applications with an average age of over five years. As a result, they lack the capacity to keep pace with disruptions and innovative digitalization solutions.

2.2.2. Digital maturity of public sector organizations in Morocco:

a. Strategy:
According to the IRES study, the digital strategy is in the emergence phase and represents only one chapter in the Kingdom's overall strategy. Similarly, the platform-formic strategy is considered to be at an experimental stage, and needs to be generalized across all areas of government intervention in order to reach an advanced level of maturity.

The creation of the Digital Development Agency (ADD) underscores the strategic role of digital technology in the country's new development vision. This agency is responsible for implementing the State's digital development strategy, and for promoting digital tools and the development of their use by the administration, businesses and citizens.

b. Organization:
This dimension is essential to position the digital transformation of public administration as a government priority. Governance that prioritizes digital as a lever for development, helps clarify the role of each entity and ensures the commitment of stakeholders.

However, the survey highlighted the delay in this area, given that governance is considered to be in an experimental phase, and inter-administration coordination is only effective on specific projects.

c. Human capital:
Human capital is the engine of transformation within any organization. Digital maturity is closely linked to the degree to which employees have assimilated the digital culture. Digital culture is defined by the organization and collaboration methods used, the predisposition to innovation and the spread of digital uses within the organization.

The IRES survey found that Moroccan public administration is still emerging in this area. In other words, the digital culture is still being formed in a minority part of the administration.

d. Offer:
The evaluation of this axis is divided into four sections: the citizen interface (service offering and transparency of procedures), e-participation, the business interface and public data.

The citizen interface is in an emerging phase; as public administration begins to integrate efficiency as an essential parameter in its relationship with the citizen.

E-participation (an index derived from e-government) reflects the use of online services to facilitate access to information for citizens (e-information sharing), interaction with stakeholders (e-consultation) and involvement in decision-making processes (e-decision making). On this dimension, Moroccan public administration was well positioned (17th worldwide) compared to the results published by the United Nations in 2016. However, Morocco slipped back to position 106 in 2020, reflecting the lack of continuity in efforts to modernize the way government platforms operate.

As for the interface with businesses, the Moroccan public administration maintains a predominantly administrative approach. A few initiatives have been launched to move towards a more collaborative
approach, but these remain limited, as several business representatives stressed the low level of involvement of the productive sector in the development and deployment of digital strategies.

As part of its drive to enhance the value of open data, considered a key tool for improving the quality of public services, Morocco is committed to strengthening the dissemination and re-use of public data through its www.data.gov.ma platform, which was updated on December 13, 2021. The platform provides access to data generated by several public bodies at central or regional level and organized under eight themes: trust, society, education, health, IT and telecoms, employment, cartography and research and development.

The e-services maturity assessment model, developed by the Ministry of Administration Reform and Civil Service in 2019, is based on the calculation of a score called “E-Readiness” that classifies services into four maturity levels. According to this study, 453 e-services have been collected whose level of digital maturity can be described as insufficient. In addition to the lack of fully dematerialized services and the complexity of the user experience, the survey highlighted other shortcomings, such as the lack of information on the processing time required or the steps needed to complete the service, the inadequacy of online payment platforms for services involving fees, and the absence of an online service user guide, particularly for fully or partially dematerialized services.

e. Technology and Innovation:

Respondents to the IRES survey stressed that the digital infrastructure of Moroccan public organizations is in the process of being aligned with the prerequisites of digital transformation, at least for certain components.

Since the launch of consecutive plans for digital development in Morocco, several programs have been launched to encourage innovation initiatives within public administration. However, the delay observed in previous areas, such as the absence of an eco-systemic vision in which digital is a structural component of the State's strategy, the lack of a collaborative approach with the private sector, the lack of appropriate resources and skills, and the resistance of a conservative organizational culture, are holding back the innovation process within public bodies and preventing the spread of innovative initiatives across all the Kingdom's departments and regions.

f. Environment:

As far as regulation is concerned, Morocco is considered to be a country in transition, insofar as the digital economy is well integrated into the regulatory corpus and into the practices of operators.

Indeed, the country continues to upgrade its digital legislative framework to comply with international standards, with the adoption of several laws:

- Law 53-05 on the electronic exchange of legal data;
- Law 09-08 on the protection of individuals with regard to the processing of personal data. Under this law, the National Commission for the Supervision of Personal Data Protection (CNDP) was created to ensure respect for the fundamental rights and freedoms of individuals with regard to the processing of personal data;
- Law 31-08 on consumer protection, which includes provisions on online sales;
- Law 07-03 on offences relating to automated data processing systems, which punishes fraudulent access to all or part of an automated data processing system;
- Law 88-13 on the press and publishing prohibits the illegal use of personal data for advertising purposes;
- Law no. 43-20 on trust services for electronic transactions;
- Law no. 05-20 on cyber-security, aimed at defining measures to protect information systems and guarantee secure use of digital space.

With the ongoing development of digital technologies, and in particular giant platforms that constantly collect immense amounts of personal or strategic data, the country needs to be constantly on the lookout to adapt its legal arsenal and ensure information security and data protection.
Conclusion:
In the light of previous studies, the analysis of the digital maturity of private and public organizations in Morocco revealed that, despite the weaknesses observed, companies are ahead of public administrations. This finding is a direct result of the competitive environment in which companies operate and their openness to the international market, particularly companies operating in the offshoring sector, telecoms operators and subsidiaries of multinationals. However, the Moroccan private sector is expressing the need to align public administration with digital practices to speed up and streamline administrative procedures and strengthen collaboration between the two sectors.

Against this backdrop of digitalization of economies and societies, governments must re-examine their working methods and rethink their relationship with citizens and businesses to adapt to their new needs.

In Morocco, since the launch of the "Maroc Numérique 2013" plan and the public administration modernization program, several government services have been dematerialized, such as: biometric passports, online tax payments, the MASSAR schooling management information system, the e-Intermediary on the job market, the one-stop port office, the dematerialization of public procurement and even the filing of claims.

Indeed, according to the OECD's recommendations on digital government strategies, the use of digital technologies is an integral part of government modernization strategies. The United Nations e-government development index reflects the Moroccan government's commitment to improving the digital modernization of its public services. However, these efforts have lost momentum causing Morocco's ranking to drop from position 85 in 2016 to 110 out of 193 countries in 2018. According to a 2017 OECD survey of Moroccan public institutions on digital government, implementing a successful digital transformation faces major challenges such as the pressure to cut spending or legal and regulatory barrier.

It should be noted that Morocco is steadily strengthening its regulatory framework to keep pace with the changes brought about by digitalization. However, efforts must continue to focus on offering innovative public services that enable citizens and businesses to optimize time and costs. It is therefore necessary to propagate and generalize the digital culture in all departments of the public administration, accepting an agile organization that roots digitalization in its development strategy.

In conclusion, digital maturity is an ongoing, evolving journey. Organizations must constantly assess their level of maturity and invest in digital transformation initiatives to remain competitive. Keeping up with industry best practices, engaging in continuous learning and staying abreast of new technology trends are essential to continue progressing along the path to digital maturity.
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