

Digitalization of the Algerian economy post-covid-19: state of play and challenges.

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Abstract

The study conducted in this article is based on a concise examination of a range of synthetic indicators during the period 2019-2022 relating to Algeria's positioning in the various areas of digitalization, namely: the dissemination of ICT, innovation, e-government, and the country's ability to take advantage of digital technologies. The results of this prospecting indicate a remarkable improvement in this area, nevertheless, it remains insufficient relative to the objectives aspired by the public authorities and the results achieved by comparable countries in the region.

Key words: Covid-19, Algeria, Information and Communication Technology, Digital transition, Index.

Jel Codes Classification : I10, O50, M15, O33

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رقمنة الاقتصاد الجزائري ما بعد كوفيد-19: الحالة الراهنة والتحديات

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ملخص

تستند الدراسة التي أجريت في هذا المقال إلى دراسة موجزة لمجموعة من المؤشرات التركيبية خلال الفترة 2019-2022 المتعلقة بوضع الجزائر في مختلف مجالات الرقمنة ، والتي تتمثل في : نشر تكنولوجيا المعلومات والاتصالات ، الابتكار ، الحكومة الإلكترونية وقدره البلاد على الاستفادة من التقنيات الرقمية.

تشير نتائج هذا التنقيب إلى تحسن ملحوظ في هذا المجال ، ومع ذلك ، فإنه لا يزال غير كاف بالنسبة للأهداف التي تطمح إليها السلطات العامة والنتائج التي حققتها البلدان المماثلة في المنطقة.

الكلمات المفتاحية: كوفيد-19 ، الجزائر ، تكنولوجيا المعلومات والاتصالات ، التحول الرقمي ، مؤشر

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Introduction:

The covid-19 health crisis has caused an unprecedented economic shock of supply and demand, which has upset the environment and the global economic order. The production of companies, investments, commercial exchanges, household consumption, institutions; everything has been affected by the sudden cessation of economic activity. However, these upheavals have acted as an accelerator in the digital field by boosting the use of information and communication technologies.

The Internet, which had already taken an important place in people's lives, has become the window or practically the only way to keep a link between individuals. Indeed, as early as May 2020, the international consulting firm McKinsey declared: "The recovery post covid-19 will be digital" (McKinsey, 2020). Thus, the world has resolutely set a firm foot in a new era, that of the digital revolution where digitalization reigns supreme.

Thus, digital technology is today identified globally as the fourth industrial revolution, creating major economic and social opportunities, but also bringing unprecedented changes. Thus, many states have taken advantage of the Digital wave to profoundly transform their public administrations and put in place a framework and incentive levers, thus accelerating access to digitalization at the level of society and companies.

Aware of the importance of the digital economy, Algeria has been part of this vision of modernization and the emergence of a knowledge and digitized society through a multisectoral plan called "e-Algeria 2013", since 2009. After this deadline, the plan was called "e-Algeria", it had become impossible to set a date for its realization.

However, the covid-19 pandemic has been a real catalyst and an opportunity for Algeria to renew its development model and thus accelerate its digital transition. Indeed, during the pandemic, consumers were using more the new applications that appeared during this period in various fields, in particular economic, banking, commercial, health and educational, thus allowing a greater digitalization of the economy. In this context, efforts have been made to establish the culture and use of digital technology at the administrative level, in the productive sectors and with the general public.

The objective of this work is to highlight the advances made in terms of digitalization and ICT development in Algeria at the time and in the aftermath of the covid-19 crisis. Thus, our study will try to answer the following problem :

"What is the impact of Covid-19 on the acceleration of the adoption and the generalization of the digital tool in Algeria?".

To answer this question, we adopt a descriptive analytical approach based on observation, data collection, examination of various documents and reports relating to indicators and tools for measuring the degree of digitization of the Algerian economy during the period 2019-2022.

To carry out our study, we will first present a review of the literature on digitization and digital transformation, then we will present an overview of the evolution of the digitization of economic sectors around the world with particular reference to Algeria. Finally, we will draw up an inventory of Algeria's positioning, at the time and in the aftermath of the covid-19 crisis, in the various fields of digitization through the analysis of national and international indicators for measuring digitalization.

I-Literature review :

A review of the academic or professional literature reveals the vagueness of the contours of the digital economy and the multitude of definitions proposed for digital transformation.

According to "The Australian Bureau of Statistics" the digital economy is: the global network of economic and social activities that are activated by platforms such as Internet, mobile and sensor networks, including e-commerce. Also activated by efforts to achieve efficiency and productivity in production processes, inventories and knowledge management (BSI Economics, 2015).

The OECD definition seems to us to be the most precise and all-encompassing. This organization explains to us that digital transformation refers to the economic and societal effects of digitization. It refers to the use of digital technologies and data, as well as the interconnections that give rise to the birth of new activities or the evolution of existing activities (OECD, 2019).

Digitalization is a process consisting in using digital technologies and information to transform the operations and / or processes of organizations (companies, administrations, ...). We can distinguish 3 three phases according to the level of complexity: the automation of an operation or a single process (online purchase), the automation of several related processes (Supply chain) and finally the automation and integration of multiple systems supporting business processes or information flows in the organization's management systems (Aubry M. & Sanoussy-Sow M., 2021). It has made it possible to reduce production costs, optimize business results and sometimes even create new revenue opportunities and new experiences for customers. Digital transformation, rather refers to the strategic transformation of customer /user-oriented organizations. It requires a transversal organizational change as well as the implementation of digital technologies.

The transversal nature of the digital economy impacts all sectors of activity, it is at the origin of new innovative sectors and has made the existence of other sectors dependent on it (Lemoine. P., Lavigne. B and Zajac. M., 2011). It includes the ICT sector (computer software and services, hardware, telecommunications), user sectors (health, banking, transport, agriculture, distribution, automotive), and sectors with high digital content (E-commerce, online services, online music), the latter could not exist without these technologies.

A wave of digital research has emerged since the 1950s including microchips in the 1950s, followed by the first transmission of messages on ARPANET (an early version of the Internet) in the following years. Then the first step towards the advent of personal computers in the 1970s and after the revival of the World Wide Web in the 1980s, it was then adopted by the general public in the 1990s.

At the beginning of the 2000s, a new situation had established with the appearance of a new dimension, the introduction of the digital approach towards the digitl transition was clearly well underway. In the commercial field, the policy of multinational companies was the introduction of the digital component in their advertising campaigns, and retail sales, while most of the purchase transactions were carried out in boutiques and in physical supermarkets, usually in physical currencies.

From 2015 to 2019, the predominance of technological equipment and the acceleration of the expansion of the use of digital tools in developed nations have contributed to the explosion of digital transactions. Multinational corporations have focused above all on digital technology by exploiting technology and "Software as a Service": a software distribution model in which a third-party provider hosts the applications and makes them available to its customers via the internet, this method is being used for the first time in France.

From the arrival of the Covid-19 pandemic to the present day, there has been a profound change in the way the use of digital technology, so that the digital tool is not considered as a mode, but as an essential working tool passing through the private sector to the public sector, it integrates into all areas namely health services (E-health, E-consultation, and E-surgical operations and education (lectures, symposiums, online seminars) and use digital payment

systems (digital transactions, cryptocurrencies or digital currencies, ... etc.), commercial exchanges through E-commerce.

II- The sectors of digitalization: reference to Algeria

The digital transformation is affecting the entire economy by moving from the media to tourism, financial activity, education, agriculture, health, etc. The objective of this section is to take an overview of the evolution of the digitalization of economic sectors around the world and put the cursor on the state of digital transformation in Algeria compared to the developments observed in the world.

II-1-Health:

The use of digital technologies in the health sector allows the dematerialization of certain medical care operations. Thus, technologies such as the Internet of Things, virtual care, remote monitoring, artificial intelligence make it possible to improve health outcomes through better patient management, better precision in treatments and better quality of care.

The covid-19 health crisis has turned health systems upside down and confirmed the importance of the digitalization of the health sector, both in terms of interactions with patients and the management of services, various infrastructures and medical staff. Thus, many countries around the world have used a variety of digital health tools to respond to the covid-19 crisis in four main areas: communication and information, monitoring and surveillance, support for the provision of health services and vaccination (Gemma A.W., Fahy. N., Aissat. D. et al., 2022).

Most countries have created and implemented digital tools and platforms to collect and share data and information on covid-19, either through existing tools or devices specially developed to better monitor the pandemic. This included the creation of web pages and dashboards presenting key data such as the number of cases, deaths and vaccination rates.

In Algeria, the covid-19 pandemic has put the national health system to a severe test and has clearly revealed its vulnerability and therefore the imperative modernization of its structures which should involve mandatory digitization at all levels of management of this sector: administrative, commercial, communication intra and inter-health structures and priority digitization of patient medical records.

In addition to the creation of a national digital platform for identifying cases of contamination rates, and teleconsultations provided by a partnership of doctors of all specialties, health structures in Algeria today continue to operate outside the digitization of medical records and digital communication intra-hospital and inter-hospital. The paper file continues to reign supreme in almost all public health structures.

Aware of the challenges of digital transformation and the considerable benefits that it can bring to the national economy, Algeria launched in January 2023 a strategy to generalize digital services in all hospitals, through the establishment of an electronic medical record, with the objective of strengthening patient safety and the efficiency of medical services.

II-2-Teaching and Higher education :

Against all odds, around the world, the coronavirus pandemic prevents the conduct of face-to-face teaching in an unexpected way. As a result, methods and practices of distance education are being implemented. Given the uncertainty that hung over the evolution of the pandemic, distance learning strategies have been developed and have become an absolute priority for most countries.

In this context, Crawford et al., (2020), through a documentary analysis of the higher education strategies adopted during the pandemic in 20 countries on all continents, have shown that distance education is the most important strategy that these countries have pursued to continue the educational process, with differences recorded in its results depending on the degree of digital development for each country.

In Algeria, in order to face this crisis, crisis management strategies have been proposed by the Ministry of Higher Education based on online learning as a new form of education. In addition, he therefore decided to grant free access to university platforms. As for educational resources, the teacher is free to choose the nature of the educational documents to be made available to his students: scripted courses, interactive courses, PDF documents, PPT documents, video. For the design of the courses and the implementation of these distance learning devices, the use of the MOODLE platform has been set up in order to homogenize the technological structures, the tools and their pedagogical characteristics.

II-3-The companies :

For more than two decades, the majority of companies have undertaken their digital transformation driven in particular by the increase in Internet penetration rates worldwide, new technologies, innovations, connected objects, but also encouraged by the increasingly tech-savvy consumer demand.

Digitalization is no longer a choice, but a necessity for all companies that wish to remain viable and competitive (ILO, 2022). Digital transformation has become an unavoidable and permanent strategy to be developed over the long term in companies to guarantee the proper productive and organizational functioning, to meet new consumer demands but also to offer the best customer experience to build customer loyalty.

In times of covid-19 health crisis, overnight with the implementation of confinement, millions of people have been forced to work remotely. The first observation was the decentralization of work. Teleworking has been a boon for the companies that have developed it, allowing the continuity of much of the activity remotely. Twilio's report (2020) on the digital transformation of companies and their customer engagement strategy in times of Covid-19 affirms that Covid-19 has been the digital accelerator of the decade for companies. Thus, in a few months, companies have made a great advance in terms of digitalization, whereas previously these same strategies took years to be deployed.

In Algeria, the use of digital tools by companies before the covid-19 crisis was very limited. However, the COVEPE survey carried out by the World Bank on the impact generated by the Covid-19 pandemic on the economic and financial situation in Algeria, reveals that companies have made greater use of digital technology in response to the crisis (World Bank, 2021).

Among the companies surveyed, 30% have started using digital tools and 26% have increased their use of the Internet, social networks, specialized applications or digital platforms in order to support their commercial activities. The main objective cited by the companies that relied on digital tools was to increase sales (for 31% of companies), to support marketing (for 18% of companies) or to support their managerial practices (for 17% of companies), while digital tools represent 16% of these companies' sales. On the other hand, 44% of the companies surveyed indicated that they did not rely on any form of digital tools to support their business operations. These figures clearly confirm the low awareness of the asset of digital technology for business development at the level of the entrepreneurial fabric.

II-4-Banking and financial services :

The innovations that have followed one another in recent years in the field of information and communication technologies have profoundly modified the nature of financial services and have given birth to new entrants, namely Fintech and online banking (Anil & Alistair, 2019).

The banking industry is among the sectors that have benefited the most from digital transformation by occupying the fourth place on the podium, behind ICT, media and professional services (Gandhi et al, 2016). In order to respond efficiently and quickly to customer expectations, banks have developed their service distributions by staying connected

with their customers via websites and digital applications, of which the internet is the most important tool, making it possible to facilitate commercial exchanges through electronic payments.

The digitalization of the sector has accelerated in the era of the health crisis linked to covid-19. The latter encouraged the use of teleworking due to the lockdown and therefore the use of remote banking services. Prolonged lockdowns due to the pandemic have prompted millions of men and women to change the way they pay for groceries or utility bills. They have switched from physical cash payments to digital payments made directly from an account, via, a direct transfer, the use of a credit or debit card, or a mobile money account (Global Findex, 2022).

In Algeria, the covid-19 health crisis has highlighted this imperative for banks, as well as companies elsewhere, to subscribe to this digitization and digitalization process, or even helped to accelerate its pace. The digitalization of Algerian banks is, therefore, an axis of the financial reform which advocates a modernization of banking services and a relaxation of procedures, by placing the customer at the center of the strategy aimed at improving the governance of public banks and strengthening their role in financing the national economy.

III- The current state of digitalization in Algeria: statistics and index

Despite the implementation of policies aimed at developing the telecommunications sector, since the early 2000s, Algeria did not have a clear strategy to provide an appropriate and favorable digital environment for digital transformation.

Indeed, the largest of the modernization projects corresponds to the digitization that began in 2008 with a multisectoral plan called "e-Algeria 2013". The objective was to digitize all sectors by 2013, and thus make the country at the same level as Malaysia or South Korea, two countries held as a reference during the development of the plan. After this deadline, the plan was called "e-Algeria", it had become impossible to set a date for its realization. In 2017, the completion rate of the e-Algeria plan was 38% reflecting the slowness in the execution of the plan, caused by the exhaustion of resources and the difficulties of coordination between the various state departments (Lounas H., 2022).

However, the advent of the covid-19 crisis has pushed the public authorities to become aware of the interest of digitalization (whose solidity has been tested during lockdown) and have thus included the digital conversion of the national economy in the chapter of priorities enshrined in the national socio-economic recovery plan 2020-2024.

In the following, we will try to examine the level of digitalization achieved at the time and in the aftermath of the covid-19 crisis, based on some local and international indicators.

III-1- Structural indicators :

Like many countries around the world, Algeria has sought to develop the information and communication technologies (ICT) sector through improving access to telephone and Internet services on the one hand, and accelerating the process of creating economic institutions in this sector and supporting their activity and competitiveness on the other hand.

The following table indicates the evolution of the ICT sector in Algeria through the analysis of several structural indicators in this sector between 2019 and 2022.

Table n°1: Development indicators of the ICT sector in Algeria.

Structural indicators	2019	2020	2021	2022
Number of fixed telephony subscriptions.	4.1M	4.7M	5.09M	5.57M
Number of mobile phone subscriptions.	45.42M	45.55M	74.01M	49.02M
Number of operators Fixed Internet	3.58M	3.78M	4.1M	4.7M
Number of mobile Internet operators	36.91M	38.77M	41.78M	44.75M
Population using the Internet (%)	47.7 %	49.0 %	59.58 %	62.9 %
Postal indicators				
Post offices	4 000	4 057	4 106	4 189
ATM Number	1 403	1 407	1 409	1 920
CCP Accounts	22.62M	23.61M	24.71M	27.03M
Electronic payment cards (including EDAHABIA)	5.6M	6.76M	8.84M	10.12M
M=millions				

Source: Produced by autors from statistics of the Ministry of Post and Telecommunications, Algeria, 2022.

From an absolute rather than a relative point of view, the figures illustrated in the table above reflect a remarkable development of the Information and Communication Technologies sector during the period 2019-2022. This development is due first of all to public support and investment in this sector and to the acceleration of the process of adoption of ICT and electronic payments by the Algerian population, in time and in the aftermath of the Covid-19 health crisis. For example, the number of mobile internet operators increased from 36.91 million to 44.75 million between 2019 and 2022, an increase of 21.24%.

With regard to postal indicators, there has been a very significant increase in the number of magnetic card holders, from 5.60 million to 10.12 million between 2019 and 2022, an increase of almost 100%. Consequently, the population's monetization rate has increased from 12.7% to 23% respectively between the two years. However, this rate remain lower than those recorded in comparable countries such as Morocco and Tunisia where they record rates of 51.24% and 54.5% respectively in 2022 (Banque Al-Maghrib, Banque of Tunisia, 2022).

In addition, the number of Automatic Teller Machines (ATMs) in operation reached 1 920 in 2022 against 1403 in 2019, i.e.: one ATM for every 22 916 inhabitants; a result that remains lower than the commonly accepted international standard which is 1 ATM for every 5 000 inhabitants. Thus, efforts must be made to cover the entire national territory with an increasingly dense network of ATMs aimed at popularizing the use of the card.

III-2-International index:

Due to its importance in the global economy and industry and its influence on other sectors and overall on the image of the country (attraction of investors and business climate) the degree of digitalization of economies has become the focus of international rankings. In the following, it will be a question of following the position of Algeria according to the international rankings relating to E-government (EGDI), innovation (GII), the preparation of networks for digitalization (NRI).

III-2-1-E-government: EGDI index

Electronic administration or E-Government consists of the adoption of information and communication technologies by the government in order to offer more efficient public services online and close to the citizen. Thus, a survey on the United Nations electronic administration establishes, every two years, the E-Government Development Index "EGDI" which makes it possible to assess the degree of digitization of the public administration. It is a composite index based on the weighted average of three standardized sub-indices: telecommunications infrastructure, human capital and online service.

Table n°02 : Evolution of Algeria's ranking according to the "EGDI" index

Year	2014	2016	2018	2020	2022
EGDI value	0.3106	0.2999	0.4227	0.5173	0.5611
Ranking	136 th	150 th	130 th	120 th	112 th

Source: Report of the International Indices relating to the Postal and Telecommunications sector in Algeria, 2022, p. 3.

In terms of the development of electronic administration, Algeria recorded a positive evolution in 2022 compared to 2020, and has been ranked in the High/High EGDI group since 2020. This improvement is achieved thanks to the various actions followed within the framework of the various strategic plans implemented. Algeria has thus gained 8 places in the international ranking, going from 120th place to 112th place out of a total of 193 countries surveyed, with a score of around 0.56 (1 is the maximum value).

The process of digitalization of the Algerian administration is moving forward with sure steps, but the pace of its evolution remains rather slow. It would be imperative to accelerate the process of digitalization of the Algerian administration in order to offer citizens transparent and efficient public services and also expand the range of digitized services.

III-2-2-Innovation: the global innovation index (GII) :

In an increasingly knowledge-based economy, innovation is currently attracting particular interest, both from investors and from governments regarding to policies implemented for the promotion of activities with a high technological content.

The Global Innovation Index (GII) captures the level of creativity of each country according to its innovative potential. It counts as a key means and a decision support tool in the development of innovation promotion strategies. The GII is a weighted index calculated from 80 indicators (in inputs and output of innovation) whose performance score varies from 0 to 100. On a global scale (out of 132 countries), Switzerland, Sweden and the United States are in the top 3 of the ranking in 2022 (Global Innovation Index, 2022).

Table n°03: Evolution of the ranking of Algeria according to the "GII" index

Year	2019	2020	2021	2022
GII	113 th	121 th	120 th	115 th
Innovation input	100 th	111 th	109 th	110 th
Innovation output	118 th	126 th	128 th	118 th

Source: Produced by authors from Global Innovation Index Report, 2022.

It is clear from the table above that Algeria initially lost 8 places in 2020 compared to 2019, which is explained by the fact that the efforts made do not go at the same pace as those made by other countries that surpass us at the level of the said ranking. Then, Algeria ranks 115th in 2022 and gains 5 places compared to its ranking in 2021 which reflects the desire to catch up with the lag in this area, in particular following the covid-19 crisis, whose uncertainty about the future has given the opportunity to implement innovative digital transformation strategies.

It also appears that Algeria obtains better results in terms of investments in innovation (inputs) compared to its level of innovation products (outputs) in all rankings ranging from 2019 to 2022.

Table n°04: Inputs and production of the innovation system according to the “GII” in Algeria during the year 2022.

Inputs				
Infrastructures	Institutions	Human capital and research	Market sophistication	Business sophistication
102 th	99 th	82 th	125 th	120 th
Outputs				
Production and creativity		Knowledge and technology		
109 th place		118 th place		

Source: Produced by authors from the statistics of the Global Innovation Index, 2022.

The main strengths of Algeria as to innovation efforts lie in the input relating to "human capital and research" which ranks the country 82nd in the world. On the other hand, the country is lagging behind in innovation with regard to the sophistication of markets and activities. In view of these results, Algeria presents an important potential in terms of innovation inputs, nevertheless the resulting outputs are out of phase with the expected results. This could be explained by a lack of coordination between the various stakeholders (companies, universities and research institutes), the overwhelming bureaucracy, the lack of means of financing projects, etc.

Algeria is currently working on the development of policies related to the promotion of innovation and the consolidation of its national ecosystem. It is about setting up a proactive development policy for the technology sectors -startup development- and betting on future technologies (artificial intelligence, Big-Data, block chain, etc.) and also an attractive framework for international players in the digital ecosystem.

Table n°05: Evolution of the ranking of Algeria according to the “NRI” index.

Year	2019	2020	2021	2022
NRI Index :				
Score	35.30	35.15	38.93	39.48
World ranking	98th/121	107th/134	100th/131	100th/131
The pillars of the NRI: (Score and Ranking)				
1) Technologies	24.81 (97th)	25.68 (108th)	36.88 (90th)	33.58 (100th)
2) Economic agents	31.94 (93th)	38.85 (86th)	40.61 (89th)	37.92 (86th)
3) Government	39.81 (108th)	25.24 (120th)	35.02 (118th)	39.41 (107th)
4) Impact	44.83 (87th)	40.85 (101th)	43.02 (101th)	47.02 (96th)

Source: Produced by authors from NRI reports (2019-2022).

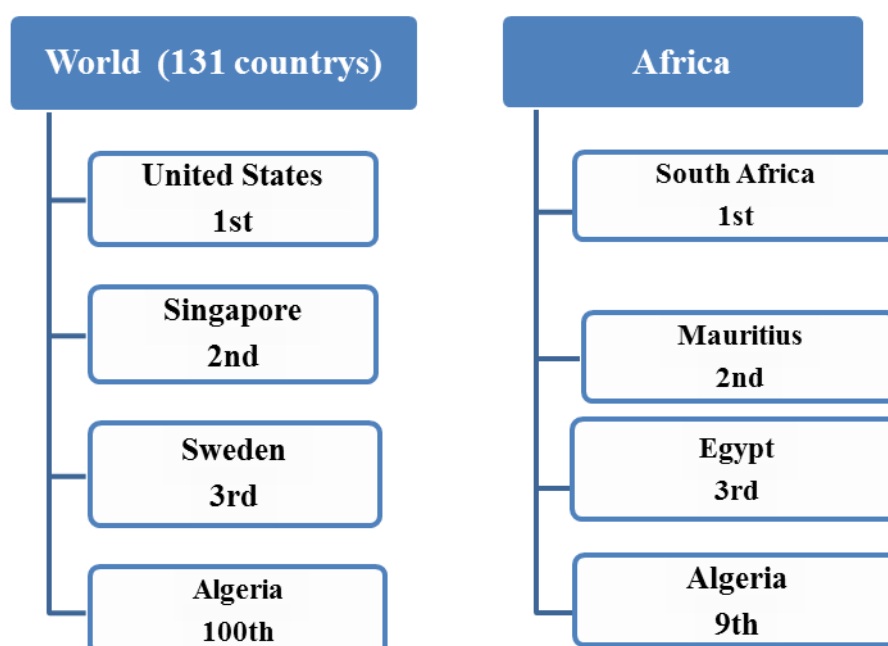
The table n°05 shows that according to the NRI index, Algeria lost 9 places in 2020 compared to 2019 (as for the GII index above), something that is also explained by the fact that the efforts made by Algeria do not go at the same pace as those made by other countries that surpass us at the level of the said ranking (NRI). Then, she will make up for it relatively by gaining 7 places in 2021 and remains at the same position in 2022.

Algeria's ranking on the four pillars of the NRI does not exceed the world average (50.22), reflecting a lack of preparation of the country for the integration of new technologies

and the need to deploy more efforts in terms of investments, mainly in the "Technology" and "Government" pillars, which record the most unsatisfactory results.

Indeed, in 2022, regarding the "Technology" pillar, we note notable deficiencies in the level of spending on computer software (120th) and application development mobiles (117th). For the "Government" pillar, the shortcomings mainly lie in digital inclusion (120th), regulatory quality (128th) and electronic payments (129th). For the remaining pillars, "Economic agents" and "Impact", there are some decent performances recorded at the level of mobile broadband Internet traffic in the country (36th), R&D spending carried out by the government and by higher education institutions (37th), Prevalence of the gig economy (33rd) and income inequality (10th).

Figure n°01: Ranking of Algeria according to the NRI in 2022.



Source: Produced by authors from the statistics of the NRI report, 2022.

This figure reflects that the United States, Singapore and Sweden occupy, respectively, the first three places at the level of the ranking and are, therefore, the countries best placed in the world to take full advantage of digital technologies.

As for Algeria, it ranks 100th in the same way as in 2021. At the level of Africa, it is ranked 9th ahead respectively by South Africa, Mauritius, Egypt, Kenya (4th), Morocco (5th), Tunisia (6th), Senegal (7th) and Ivory Coast (8th).

In total, the analysis of the results of the NRI 2022 reveals that Algeria has a lack of investment in new technologies such as the Internet of Things and artificial intelligence. These investments are likely to involve various other adjacent actions related to the intensification of the use of ICTs, the development of digital skills and organizational changes. This approach requires the conduct of better governance in order to successfully integrate Algeria in its race towards digital transformation.

V-Obstacles and challenges related to the growth of digitalization in Algeria:

If efforts have been undertaken in terms of digitalization in Algeria, the fact remains that the delay to be made up is great. This situation is explained by the presence of several obstacles that persist and hinder the country's full entry into the digital era.

Indeed, this delay is primarily due to the legal and regulatory framework of public procurement which does not favor the adoption of digital technology as a pillar of

administrative reform. Thus, the regulatory barriers do not allow the effective implementation and large-scale use of digital platforms.

Then, the resistance to change and the rejection of innovation. Also, the lack of awareness of the contributions of digital technology by some decision-makers, the digital governance deficit in the public sector and the cumbersome alignment of legal and procedural frameworks with new digital services.

In addition, a shortage of profiles and specialized human resources active in digital professions and the absence of a national digital inclusion strategy allowing access for all categories and social classes to digital tools.

The other obstacle for the development of digital technology in the public sector is linked to the multitude of bodies concerned with digital technology at national level and the lack of coordination between them. However, in June 2020, a ministry of digitization was created with the objective of successfully transitioning to a digital state. (Long before the creation of this ministry, 28 ministries had an entity responsible for digitization which establishes its digitization action plan for each year. The Ministry of digitization is only called upon to monitor and gather information on the implementation of the plans established by the ministries).

A culture and digital uses that are still limited among citizens, companies and public administrations, and insufficient change management, with the challenge of strengthening the skills of public administration employees and democratizing the use of digital technology. In addition, the novelty is a source of distrust. Digitization is presented as a tool in the fight against corruption, which makes some people suspicious of the traceability of their actions. Finally, a digital infrastructure, which despite the efforts made, retains the potential for improvement due to the remaining white areas to be covered and the low data throughput.

Conclusion :

In the end, we can say that the development of digital technology should no longer be considered as the only prerogative of the telecommunications sector. Digital technologies are causing radical transformations in our economies and our countries and concern all sectors of the economy : from health to finance, including education, e-commerce and public administration. It is therefore an integrated economic project that must be based on a global vision linking reflection, infrastructures, platforms, digital skills and applications in key sectors.

The Coronavirus pandemic that has hit the whole world with full force has been an opportunity for Algeria to renew its development model and thus accelerate its digital transition. In recent years, this has experienced a significant progression in Algeria, boosted by the evolution of the use of ICT, the increase in the number of Internet users and e-consumers.

The analysis of the evolution of the digitalization measurement indices during the period 2019 - 2022 indicates a significant improvement in this area, nevertheless, it remains insufficient relative to the objectives aspired by the public authorities when setting up national programs aimed at the development of Digital. This situation is explained by the presence of several obstacles that persist and hinder the country's full entry into the digital era.

Thus, improving the performance of digital transition and digitization of Algerian establishments appears to be a major necessity to satisfy the needs of the population and all stakeholders. This movement will focus on :

- The adoption of a concrete model based on the needs of public organizations while respecting the cultural, social aspirations and expectations of citizens who are considered as potential customers not to be neglected.
- Boost the use of ICT by companies and consumers through the strengthening of security and trust in digital technology.

- The development of efficient and innovative administration and comfort in institutional and financial modalities as key vectors of success.
- Focus more on emerging technologies such as artificial intelligence in the administration's activities through investments in equipment and skills.

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