

Algeria's adoption of e-business under the fourth industrial revolution

تبني الجزائر للأعمال الإلكترونية في ظل الثورة الصناعية الرابعة

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Abstract

The study aimed to diagnose the reality of e-business in Algeria and its readiness to ensure a smooth transition towards this new type of business in the light of the Fourth Industrial Revolution, by identifying the readiness of its infrastructure and the degree to which it adopts digital technology. To achieve the goal, the descriptive analytical approach was used by dissecting the phenomenon in question and analyzing the relevant data. The study showed that Algeria is unable to adopt e-business in the light of the Third Industrial Revolution, and that the loss of the bet of the Third Industrial Revolution does not necessarily mean influencing the adoption of the concepts of the Fourth Industrial Revolution, where Algeria's chances remain full due to its possession of the elements of transition, if the situation is remedied.

Keywords: e-business; e-management; digital technology; fourth industrial revolution; infrastructure.

الملخص

هدفت الدراسة إلى تشخيص واقع الأعمال الإلكترونية في الجزائر ومدى استعدادها لضمان التحول السلس نحو هذا النمط الجديد من الأعمال في ظل الثورة الصناعية الرابعة، وهذا من خلال التعرف على مدى جاهزية بنيتها التحتية ودرجة تبنيها للتكنولوجيا الرقمية، وبلوغ الهدف تم الاستعانة بالمنهج الوصفي التحليلي من خلال تشريح الظاهرة محل البحث وتحليل البيانات ذات العلاقة. أظهرت الدراسة عدم قدرة الجزائر على تبني الأعمال التجارية الإلكترونية في ضوء الثورة الصناعية الثالثة، وأن فقدان رهان الثورة الصناعية الثالثة لا يعني بالضرورة التأثير على تبني مفاهيم الثورة الصناعية الرابعة، حيث تبقى حظوظ الجزائر كاملة لما تملكه من مقومات الانتقال إذا تم تدارك الوضع.

الكلمات المفتاحية: أعمال إلكترونية؛ إدارة إلكترونية؛ تكنولوجيا رقمية؛ ثورة صناعية رابعة؛ بنية تحتية.

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Introduction

The topic of E-business is considered worthy of attention and study as it is one of the topical issues of great concern by organizations and governments, due to its effective contribution to achieving competitive advantage by enabling the efficiency of communication processes and increasing the level of quality within organizations. E-business expresses modern business models through contemporary technical methods and in keeping with the scientific developments of the late twentieth century, especially concerning information technology, communication and the establishment of the Internet in particular, which later became a focus of business performance and interaction with modern technologies in a way that makes a difference compared to competitors. By the end of the 2000s, the technological advances of the 20th century had reached its peak, and the applications of artificial intelligence and digital computing technologies that had reached a digital world and virtual communities through social media culminated at the beginning of a fourth industrial revolution based on current technology, the first manifestation of which was the 46th session of the World Economic Forum in Switzerland in 2016, where many of the details of human life are expected to change with the emergence of a new generation of services based on digital interaction.

Based on the above, the problem of this study is highlighted as follows: What is the reality of E-business in Algeria in light of the first milestones of the Fourth Industrial Revolution in the world? This central question arises from the following sub-questions:

- To what extent do Algeria adopt the concept of E-business in the light of the third industrial revolution?
- What are the requirements for integration into the Fourth Industrial Revolution?
- How ready are Algeria to engage in a new generation of technology?

The importance of the study

The study derives its importance from the fact that it deals with a new topic that will revolutionize how people live, work and communicate, and is the fruit of the rapid development of technology and is connected to a new generation of businesses and services in an environment that integrates the digital world with the actual reality, it is the focus of attention of the countries and societies that are intellectually and scientifically high-end and that are racing with all the power to take the lead and reserve key roles in the industry and control of the future. The topic is also a fertile area for scientific research, which can provide added value to researchers in the academic scientific side and practitioners in the applied field.

Study methodology

To address the problem of study, the descriptive analytical approach was followed through the careful description of the phenomenon in question and its quantitative and qualitative expression, believing that it is the most appropriate

way to familiarize myself with the aspects of the subject. In parallel, Parallel to that, participation in observation was relied upon to obtain reliable information from the source.

Study objectives

Through this study, we aim to achieve the following objectives:

- Clarification of concepts related to e-business;
- The theoretical rooting of the concept of the fourth industrial revolution;
- Diagnosis of the reality of the Algerian institutions and administrations adopting e-business under the current technology (the third industrial revolution);
- Explore the technical and human readiness of Algeria to adopt e-business in light of the fourth industrial revolution.

E-business

In the era of technology and the advancement of modern technology in all aspects of life, electronic business has become a major element in the strategic thinking of any organization, and it is no longer possible for Algerian institutions and administrations to remain immune to these developments, rather they must employ information and communication technology in their practices and dealings to ensure the improvement of their services and effectiveness. Its internal and external communication is specific to the advantages provided by the Internet that allows the interaction of performance with technology.

Concept of E-business terminology

The term E-business is a modern term and is intended to adopt information technology and communication to support business activities in various fields with the advantages that qualify them to break with traditional transactions, and intellectuals and researchers have listed several definitions of the term each according to his view of the subject, including:

- Electronic business (E-business) refers to the use of the Web, Internet, intranets, extranets or some combination thereof to conduct business. E-business is similar to e-commerce, but it goes beyond the simple buying and selling of products and services online. E-business includes a much wider range of businesses processes, such as supply chain management, electronic order processing and customer relationship management. E-business processes, therefore, can help companies to operate more effectively and efficiently. (techopedia, 2020)

We can say that E-business is based on the idea of automating performance in the business relationship and is an application of IT and communication technologies in support of administrative, service, productive, financial and other activities. It also extends to the relationship between the organization and its agents, customers, employees and each stakeholder, and is not limited to performance but goes beyond it to oversight and evaluation, so E-

business expresses a comprehensive vision of all the organization's activities electronically to rationalize its management and ensure the effectiveness of communication and organizational coordination.

E-business characteristics

Although there is no unified definition of e-business, we can draw a set of characteristics that distinguish it from the works in the classical environment, which is concerned with the possibility of automating transactions characterized by speed, accuracy, and avoidance of human error due to the use of an electronic intermediary between the service provider and its recipients, and these characteristics are summarized as follows: (ابو النصر، 2017، صفحة 171)

- E-business is a means of raising the performance and efficiency of the organization and not an end in itself;
- The absence of paper documents in transactions, where electronic archives, e-mail, voice messages, and automated follow-up application systems are used instead of paperwork;
- Non-adherence to time, transactions in E-business can be conducted at any time without time and time, and it is available throughout the day, month and year without interruption;
- Spatial separation, where modern technologies are adopted instead of direct communication and the Internet, in particular, allows the possibility of managing the organization's dealings efficiently from any geographical location, as access to databases takes place from anywhere without affecting performance;
- The absence of rigid regulations, working through the network and smart institutions and adopting the knowledge industry;
- Reliance on electronic systems such as instant follow-up systems, overall quality, and institutional memory.

The Fourth Industrial Revolution

The 21st century is the era of the information technology revolution in which there has been a tremendous scientific breakthrough that has changed the way people live, think, and interest. The accumulated knowledge and the unprecedented development witnessed in the last decade have prompted the acceleration of the emergence of the so-called fourth industrial revolution, where it is expected that the way of life of peoples will change again as a result of the emergence of artificial intelligence, which is the backbone of building the future and one of the pillars of this industrial revolution in addition to robots and the internet of things and others.

The Fourth Industrial Revolution or **Industry 4.0** is the ongoing automation of traditional manufacturing and industrial practices, using modern smart technology. Large-scale machine-to-machine communication and the internet of things are integrated for increased automation, improved communication and self-monitoring, and production of smart machines that can

analyze and diagnose issues without the need for human intervention. (Moore, 2019).

The world is currently on the brink of a new technological revolution based on the foundations of the Third Industrial Revolution, particularly on the Internet and high-energy processors, as well as the ability to store information and unlimited access to knowledge, which foreshadows the beginning of a new era led by unprecedented innovations (2017، عيد العظیم).

Professor Klaus Schwab, Founder and Executive Chairman of the World Economic Forum, has been at the center of global affairs for over four decades. He is convinced that we are at the beginning of a revolution that is fundamentally changing the way we live, work and relate to one another (Schwab, 2020), Which means we will move from digitization to creative digitization, an era based on high competencies, human talent, and super-intelligent minds because the human role in this age will be limited to supervision and follow-up because production, distribution and maintenance chains will be fully automated and connected.

Concept of the Fourth Industrial Revolution

The Industry 4.0 expresses the merging of digital, physical and biological systems, which would positively affect the standard of living of human beings. A few years ago, no one had ever imagined that a smartphone, which was considered a revolutionary means of communication, would, in addition, be able to diagnose most medical problems for its user depending on (Artificial intelligence with the help of cloud computing), which guarantees the bearer a virtual trip to the doctor while he sits at his home, and this is the real entrance to the fourth industrial revolution, where artificial intelligence is its most important dimension, as it is driven by Big Data, IoT, 3D Printing and Computing Cloud coupled with artificial intelligence (AI). (2018 ونيس الترهوني،)

In other words, the Industry 4.0 came to eliminate the boundaries between what is material and what is digital and what is vital, and to eliminate the differences between machine and man. (2019، حمودة)

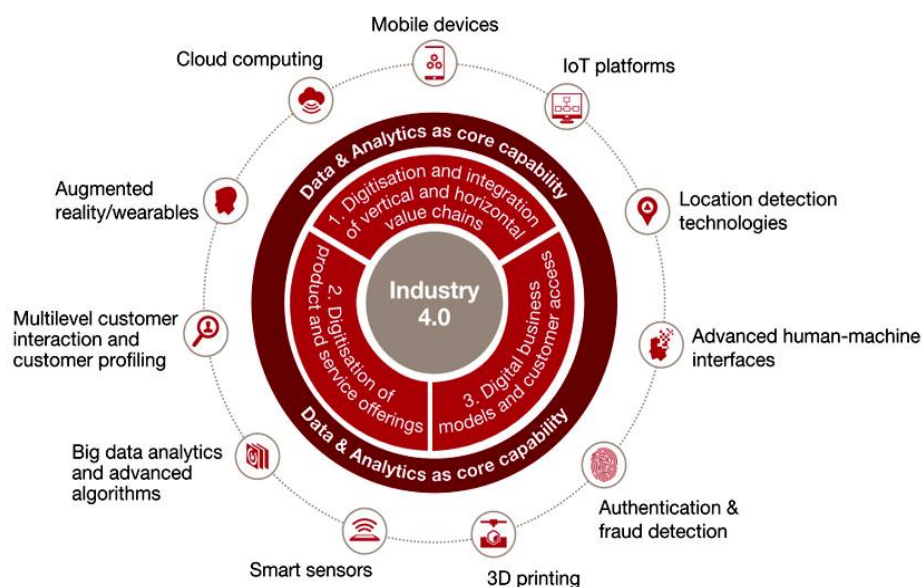
Industry 4.0 is a name given to the current trend of automation and data exchange in manufacturing technologies. It includes cyber-physical systems, the Internet of things, cloud computing, and cognitive computing. Industry 4.0 is commonly referred to as the fourth industrial revolution. (Simco Ion, 2020)

Industry 4.0 Technologies

Generally, Industry 4.0 describes the growing trend towards automation and data exchange in technology and processes within the manufacturing industry, including Internet of things (IoT); Industrial internet of things (IIoT); Cyber-physical systems (CPS); Smart manufacture; Smart factories; Cognitive computing; Artificial intelligence (AI); Cloud-Computing; 3D printing; Robots; Biotechnology; Blockchain; Capture, Store and transfer energy. This automation creates a manufacturing system whereby machines in factories are augmented with wireless connectivity and sensors to monitor and visualize an entire

production process and make autonomous decisions. (Twi Global, 2020)

Form (1): Industry 4.0 framework and contributing digital technologies



Source: Anil Kurana and Badr al-Ullama, 4th Middle East Industrial Revolution Survey 2017, PricewaterhouseCoopers PWC.

Algeria's location in the electronic environment

Algeria cannot remain isolated from developments in the environment, particularly with regard to the use of modern technology, and perhaps the imposition of a biometric passport by the International Civil Aviation Organization (ICAO) for security reasons is a good sign that global developments must be kept up to date, and Algeria's adoption of technology is manifested in two terms: governmental and private, and in parallel, we cannot diagnose Algeria's position in the digital environment without identifying indicators for the development of IT, communication and information society.

Indicators of the development of ICT and the information society

Algeria's readiness to actually adopt E-business can be informed by a set of indicators related mainly to its infrastructure and the degree of community involvement in the pursuit of scientific and technological development through: (Ministry of Post and Telecommunications, 2020)

Fixed telephone network indicators

The number of fixed-line subscribers in Algeria in recent years is moving towards qualitative stability, where it has exceeded 3 million subscribers since 2015, fixed-line density has declined to 07.50 c/o in 2017 and in 2016 8.26 c/o due to the citizen's mobile orientation.

Internet indicators

By the end of 2017, all municipalities at the national level have been connected to the fiber optic network in support of the state's efforts to modernize the telecommunications infrastructure in order to meet the needs of Internet users and provide a quality service, the international scope has not ceased to develop to reach 810,155 Mbps at the end of 2017.

Table (1) : Indicators of development of information society

| Passive infrastructure | 2013 | 2014 | 2015 | 2016 | 2017 |
|---------------------------|---------|---------|-----------|---------|--------|
| Length optical fiber (Km) | 50 800 | 61 556 | 70 700 | 76.514 | 81872 |
| Municipalities connected | 1 081 | 1 229 | 1 321 | 1 477 | 1541 |
| National Bandwidth | 172 021 | 348 000 | 1 390 000 | / | 801000 |
| International Bandwidth | 166 000 | 278 000 | 485 155 | 630 150 | 810155 |

Source: Ministry of Post and Telecommunications, 2020,
<https://www.mpt.gov.dz/en/content/ict-indicators>

As for Internet subscribers in Algeria, the number of internet subscribers in Algeria reached 37.83 million in late 2017, including 34 million mobile subscribers, and the number is expected to rise further with the introduction of high fixed-line wireless flow technology (G4LTE) and the following table shows the number of Internet subscribers depending on the nature of the technology used to access the network.

Table (2) : Number of Internet subscribers according to the nature of technology

| Internet Subscribers | 2014 | 2015 | 2016 | 2017 |
|----------------------------|------------|------------|------------|----------|
| ADSL subscribers | 1 518 629 | 1 838 492 | 2 083 114 | 2246727 |
| 4G fixed LTE | 80 693 | 423 280 | 775 792 | 919368 |
| WIMAX | 216 | 233 | 661 | 621 |
| 3G mobile | 8 509 053 | 18 021 881 | 25 214 732 | 23701023 |
| 4G mobile | -- | -- | 1 464 811 | 10968495 |
| Fixed internet | 1 599 538 | 2 262 005 | 2 859 567 | 3166907 |
| Mobile internet (3G+4G) | 8 509 053 | 18 021 881 | 26 679 543 | 34669518 |
| Total internet subscribers | 10 108 591 | 20 283 886 | 29 539 110 | 37836425 |

Source: Ministry of Post and Telecommunications, 2020,
<https://www.mpt.gov.dz/en/content/ict-indicators>

Table 3. The number of Internet subscribers depending on the speed of the flow.

| Subscribers /debit | 2013 | 2014 | 2015 | 2016 | 2017 |
|--------------------|------------------|------------------|------------------|------------------|----------------|
| 128K | 7 497 | 2 608 | 1 318 | 265 | 0 |
| 256K | 158 181 | 48 599 | 26 048 | 14 168 | 0 |
| 512K | 589 042 | 92 843 | 56 847 | 39 324 | 0 |
| 1M | 511 386 | 832 535 | 990 988 | 1 050 288 | 1069377 |
| 2M | 13 997 | 523 547 | 728 009 | 917 808 | 107434 |
| 2,3M | 1 003 | 1 617 | 1 677 | 1 500 | 1080 |
| 3M | 11 | -- | -- | -- | 1 |
| 4M | 1 465 | 10 631 | 24 522 | 47 067 | 84488 |
| 7M | 10 | 1 | 1 | 1 | 1 |
| 8M | 602 | 6 050 | 8 805 | 11 703 | 15288 |
| 10M | 18 | 1 | 531 | 1 | 1 |
| 20M | 28 | 195 | 531 | 972 | 1656 |
| 24M | 1 | 2 | 531 | 1 | 1 |
| Total | 1 283 241 | 1 518 629 | 1 838 746 | 2 083 098 | 2246727 |

Source: Ministry of Post and Telecommunications, 2020, <https://www.mpt.gov.dz/en/content/ict-indicators>

The table No. 03 has been included to make the study more realistic, as we review the number of Internet subscribers according to the speed of the flow, which is a criterion for the quality of service provided. The statistics in the above table indicate that more than 50% of the subscriptions with a speed of 01 MB of the total subscribers for the year 2017 is a very weak speed that was overtaken by technology and replaced with a speed of 2 MB for each subscriber in 2019 at the same previous prices.

The quality of the Internet in Algeria

Algeria is in the last ranks in the world in internet speed, in the latest report issued by the specialized site "Speedtest Global Index" for December 2019, Algeria ranked 174th out of 177 countries with a flow of 3.92 Mbps, while the United Arab Emirates ranked 30th with a flow of 90.57, Qatar ranked 40th at 73.94, Kuwait ranked 44th at 65.92 and Maghreb ranked 122nd in the world at 18.52, Libya ranked 148th at 12.07, Tunisia ranked 158th at 9.12,(about the fixed network). As for the mobile internet, Algeria ranked 138th out of 140 countries. (Speedtest Global Index, 2020)

Algeria's adoption of E-government

The government adopted the electronic Algeria project in 2013 and is part of the initiatives through which the Algerian government aims to achieve sustainable development in various aspects of life that affect the citizen, and this is by introducing a comprehensive advanced electronic system, and popularizing the use of modern technologies in the sectors of public administration, Communications, education and higher education sectors, banks, and others by

making their services available depending on technological means, production and development. (غزال، 2014)

An embodiment of the project, a work plan has been proposed that includes thirteen main axes, with the main objectives to be achieved over five years, and the most important of these axes are as follows: (قورين و بن يوسف، 2019)

- Accelerate the use of ICT in public administrations;
- Accelerate the use of ICT in companies;
- Adopting the digital economy, by creating the appropriate conditions for the development of the media and communication technologies industry;
- Enhancing the high-speed, secure communications infrastructure of high-quality services; - Developing human competencies,
- Financial resources: all sources of financing must be used.
- Valuing international cooperation; - Evaluation and follow-up mechanisms.

Algeria's adoption of E-business in the private sector

E-business targets activity in the private sector, and is mainly related to the general orientation of government policy and its interest in modernizing the digital environment. It is worth noting that non-governmental sectors are affected by technological infrastructure and the extent of its development, relevant legislation and laws, as well as economic freedom. In this context, and regardless of the intensity of the use of technology in the management of business organizations, it has become clear in recent times that Algeria is moving towards digitization and the adoption of electronic business, and this is through the spread of websites for online marketing, especially after the launch of third generation communication services in 2014, and the fourth generation in 2016. (قورين و بن يوسف، 2019)

E-commerce

The term e-commerce refers to the use of information and communication technology - including computers, smartphones, tablets, and others - to market goods and services. It is also defined as the use of modern technology to ensure that the functions provided by buyers and sellers are properly and effectively interconnected, in this regard, many technologies such as e-mail, information exchange programs in the electronic environment, and electronic transfer of funds including electronic balances (Visa cards and bank cards) are used on a large scale. (علي و العيداني، 2011، صفحة 53).

With the improvement of technological infrastructure indicators, trade was one of the sectors most affected by technology in Algeria, through the promotion of goods and services electronically, and the Corona pandemic (Covid 19) was a decisive factor in its recent increase, given the restrictions imposed on dealers and citizens to adhere to home quarantine and distance social. The improvement in the flow of fixed and mobile internet and the increase in the number of subscribers also contributed to the spread of e-commerce. (الاذاعة الجزائرية، 2018)

In this regard, more attention must be paid to improving the electronic environment, which is a prerequisite for the success of digital transactions, as the passage of the electronic commerce law in April 2018 is an important step in the right direction by giving a new and strong start to the sector (e-commerce), in light of the rules that frame the market and protects the rights of all parties, where electronic business operations were previously not subject to the law that frames them. (وكالة الأنباء، 2018).

E-commerce applications

These applications are as follows:

- **e-Commercial register:** In line with the nature of electronic commerce and its virtual environment, the electronic commercial register was introduced, which is a condition for practicing commerce on the Internet. (وكالة الأنباء، 2018)
- **e-Invoice:** Law 18-05 guarantees that the electronic supplier must prepare an electronic invoice that is delivered to the electronic consumer as a result of every sale or service provided through electronic communications. The legislator did not specify a special format for the electronic invoice regarding its data.
- **e-Authentication:** As it is called electronic authentication, the authentication service provider is a third party in the electronic commercial transaction, the purpose of which is to document the electronic transaction and identify the identity of the dealers.
- **e-Payment:** The means of payment are the most important components of the electronic payment system; whereby electronic transactions are settled in a way in which there are no cash or commercial notes. It is a technique in which magnetic, optical or electromagnetic means are used in the exchange and storage of information, and the European Central Bank defines it as "every transaction Payment issued and processed electronically. (زواش، 2011، صفحة 17)

Payment methods (types) in E-commerce

There are different types of payment methods and vary depending on the circumstances. Traditional money is beginning to leave its place to modern roads thanks to technology. There are various instant payment methods currently available such as mobile payment, electronic wallets, cards and more, and here are the most prominent payment methods in e-commerce: (Lyra, 2020)

Credit/Debit card payments: Card payments are one of the most used and popular ways as a push solution in the world because it's easy to use and safe. The customer just has to enter the card number, expiry date, and CVV, which has been introduced as a precautionary measure. The CVV helps detect fraud by comparing customer details and the CVV number.

Prepaid card payments: As an alternative for credit/debit cards, prepaid cards are introduced.

They usually come in different stored values and the customer has to choose from them. Prepaid cards have virtual currency stored in them. Though the adoption rate of prepaid cards is low, they are gradually becoming popular for certain niche categories.

Bank transfers: Despite its unpopularity at present, bank transfer is still seen as a key driving force in e-commerce.

Bank transfers are used if other methods fail, where customers registered in online banking can make bank transfers for online purchases and this is the safest method as transactions need to be approved and approved by customers and the process is carried out without the need for a card.

E-Wallets: E-wallet is one of the upcoming trends which gives a new shopping experience altogether. The use of e-wallets is becoming popular and it requires a sign up from merchants as well as customers. After creating an e-wallet account and linking it to the bank account they can withdraw or deposit funds.

Cash: Let's face it, in Algeria cash is the king. For e-commerce, it comes in the form of the cash-on-delivery option.

Cash is often used for physical goods and cash-on-delivery transactions. It does come with several risks, such as no guarantee of an actual sale during delivery, and theft. Though nowadays, cash on delivery does not necessarily mean customers pay with cash (they can use cards, mobile payments as payment terminals are often available with delivery agents), missing out on this is a strict NO.

Mobile payments: This digital payment solution offers a quick solution to customers. To set up a mobile payment method, the customer must download the software and link it to the credit card. As e-commerce shifts to a mobile network, customers find it more appropriate to use mobile payment options.

Cryptocurrencies: Despite its unpopularity so far, cryptocurrencies are gaining a fast but steady place as a favorable payment method, and may in the near future turn into a major payment method.

Location of Algeria under the Industry 4.0 in the Arab world

The features of future life have begun to emerge and take shape in the developed world, and soon we will witness a wide spread in the applications of the industry 4.0 (physical, digital and biological). With the widening gap in knowledge and technology between the poles of the world, is Algeria ready to adopt the technology of the future?

Algeria's steps to join the Industry 4.0

During the cabinet meeting today 02/03/2020 under the chairmanship of the President of the Republic, this meeting culminated in a statement in which one of its paragraphs dealt with the presentation made by the Minister of Small and Medium Enterprises, Emerging Enterprises, and the Knowledge Economy, on a project to establish a National Council for Innovation, to be placed under the authority of the President of the Republic. The Ministry will work to lay the legal foundations for technology transfer institutes during the first quarter of

2020, provided that the experimental phase will start across two universities by establishing two centers specialized in industrial intelligence and the Internet of things that work in cooperation with Algerian competencies abroad. (الوزارة) (الأولى، 2020). And on the other hand, the American company Google announced, on October 18, 2019, that Algeria was crowned with the Artificial Intelligence and Machine Intelligence competition that was held in Tunisia. "Google" wrote in a tweet on its official account on "Twitter" after crowning football, Algeria will be crowned again, but in technology! First and third place for teams in the Artificial Intelligence and Machine Intelligence competition, which was held in Tunisia with the support of Google (عربية، 2019). On the sidelines of the opening of the preparation workshop for the National Strategic Plan for Artificial Intelligence 2020-2030, which will be presented to the government once its preparation is completed for approval, the Director General of Scientific Research and Technological Development revealed that the state allocates annually a budget of 20 billion DZD for scientific research in the field of artificial intelligence, adding that The higher education and scientific research sector recorded an increase of more than 26% in the number of students enrolled in departments related to artificial intelligence across 14 universities that provide masters in this sector and 5 courses of training in the doctorate. The same official added that Algeria has 116 laboratories for research in the field of artificial intelligence, 568 research teams and 67 projects for artificial intelligence in robotics. (أوزاغ، 2019).

In the academic field, scientific researches of 60 Algerian researchers specialized in the field of artificial intelligence have culminated in their inclusion in the international scientific journal 'Springer', as it was announced on the occasion of the sixth edition of the international symposium on artificial intelligence and its applications hosted by the University of Science and Technology "Mohamed Boudiaf" of Oran. Under the slogan "Oran a smart city". (الإذاعة الجزائرية، 2018). Algeria was also able to enter the latest classification of the Bloomberg Innovative Countries Index for the year 2020, for the first time in its history, as it ranked forty-ninth out of (60) countries, while the UAE ranked (44) in the world and first in the Arab world. (البيان الاقتصادي، 2020).

Algeria's readiness and prospects to adopt the concepts of the Industry 4.0

The Algerian economist Nasser Suleiman believes that events should not be preempted and talk about the application of the fourth industrial revolution, while in many of our industries we depend on the second revolution, and the third revolution is only applied in a limited number of companies and factories, that is, we are still far from the fourth revolution, and he stated that he Although the industrial sector must be promoted within the framework of diversifying the economy we seek, the mistakes of the past must not be repeated (ناصر، 2018). With reference to our reality, we do not see a prominent impact of the third industrial revolution in our daily life, whether in public administration or in the

private sector and in the overall aspects of life. Algerian brains have migrated due to the marginalization of competencies and the absence of an environment that stimulates research and development. The following are the most prominent Algerian researchers in the diaspora who can be relied upon to activate the concepts of the Industry 4.0:

Prf. Belkacem Hebba: An Algerian scientist specializing in electronics, who started his career at IBM, owns more than 1,300 patents, and has been working for years to launch the Algerian Migrant Minds Association that aims to bring together all Algerian inventors in various fields. (بوزانة، 2017)

Prf. Nidal Guessoum: Algerian astrophysicist, a graduate of the University of California, spent two years as a researcher at NASA's Goddard Center, then transferred to the American University in the United Arab Emirates. He is currently a professor, his research interests include gamma-ray physics and other research. (GUESSOUM, 2020)

Prf. Kamal Youssef Toumi: One of the most famous immigrant minds in America, he succeeded in inventing the fastest robot in the world, as well as the Samsung Scanner device, to become the largest specialist in robotics and mechanical engineering, holding more than fifty patents that have served humanity. (فرقاني، 2017)

Prf. Murad Bouach: a graduate of Boumerdes University in automated media, pursued his postgraduate studies in France and then the United States of America, from which he moved to Canada in BlackBerry laboratories and is currently holding the position of Quality Officer for software and hardware in various data centers. (بوالجدري، 2019)

These competencies and many others have been making the world glories and contributing to the development of mankind far from its homeland.

On the other hand, the American economist, Jeremy Rivkin, sees the possibility of developing countries bypassing the third industrial revolution and overcoming it and moving directly to the fourth industrial revolution, which is based on clean energy and the adoption of methods that are extremely accurate, fast and efficient. To adopt such an approach, we must formulate a smart strategy that relies on employing a high level of competence and exploiting the proposals of the internal and external brains to coordinate between them and make the transition process smooth and the first thing that must be fought is corruption in all sectors. (عنيبة، 2020)

Conclusion

Despite all Algeria's natural resources and human competencies that have contributed to building the civilizations of other nations, unfortunately, we were not able to control the concepts of the third industrial revolution and adopt its concepts well, and this is what contributed to the widening of the knowledge and technological gap between us and the advanced West. However, the opportunity is still favorable and the chances are there to enter the Industry 4.0.

Study results

Based on the above, the study concluded the following:

- Algeria's inability to adopt E-business in the light of the Third Industrial Revolution as desired.
- The loss of the bet of the third industrial revolution does not necessarily mean influencing the adoption of the concepts of the fourth industrial revolution, as the latter is not an extension of its predecessor, but a start in a new revolution that will change the way of life.
- Algeria has the ingredients for a transition to the Industry 4.0, especially with regard to the use of competencies at home and abroad, where Algeria is one of the most exporting countries for minds.

▪ Discussion of results

The study showed that the infrastructure of information technology in Algeria is still fragile, and that Algeria's adoption of business in light of the fourth industrial revolution was not at the required level, either in the public sector (e-government) or in the private sector (e-commerce). Despite this, Algeria's chances of catching up continue by adopting the technologies of the fourth industrial revolution, especially with its financial and human resources that contributed to the manufacture of the civilizations of developed countries. On this basis, the study recommends:

- Adopting a comprehensive strategy to prepare for facing the future by attracting competencies in various fields.
- Paying more attention to research and development, settling patents.
- Access to the leading global experiences, especially those commensurate with our peculiarities, to extract experiences to profit from effort and time and to rationalize costs;
- Paying attention to the development of human resources, improving the outputs of higher education institutions, and focusing on scientific and technological technical specializations.
- Reducing the costs of subscribing to the Internet while increasing its flow.

limits and prospects of study

In this regard, it should be noted that this research touched on the general orientation of the Algerian State towards the adoption of modern technology and its future prospects. The researcher's opinion stems from his analysis of various indicators related to the ICT infrastructure from 2013 to 2020, as well as the material and human elements of the State that qualifies it for the industry of the future. We hope that this study will be a prelude to other research that addresses the mechanisms for shifting towards future technology and identifies our current material and human potential and suitability.

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