

Digital transformation in Algeria: a process still to be acquired

تحديات التحول الرقمي في الجزائر

SI AMER Hadjira¹, CHALLAL Salim²

¹MOULOUD MammeriUniversityofTizi-Ouzou,siamerhadjira@gmail.com,

²MOULOUD MammeriUniversityofTizi-Ouzou, salim.challal@gmail.com,

Received on:21/02/2024

Accepted on:28/07/2024

published on: 18/11/2024

Abstract:

New information and communication technologies are designed as an indispensable tool in the optimization of the various economic mechanisms in the age of digitization, and their Introduction into the various economic processes requires the meeting of all the conditions related to the proper use of these technologies, namely the productive sector of these ICT itself. Knowledge and good control of their use.

Algeria and other developing countries; strives to bridge the digital divide by putting in place essential mechanisms of not being excluded from international relations in this case trade and financial.

Keys words:

New information and communication technologies; digitalization; digital competence; the digital divide.

JEL classification codes: Q12; D56;

ملخص:

أصبح استخدام تكنولوجيا المعلومات و الاتصال في جميع قطاعات الاقتصادية حتمية لا مفر منها في عصر الرقمنة, فهي تعتبر بمثابة أداة فعالة _ إن استخدمت بطريقة صحيحة- للتحكم في تكاليف جميع العمليات الاقتصادية .ولكي تستخدم بمثابة يجب توفر بني تحتية كقطاع إنتاجي لهذه التكنولوجيا ومهارات .

الجزائر كغيرها من الدول السائرة في طريق النمو تسعى جاهدة لسد الفجوة الرقمية من خلال وضع الاستراتيجيات و الآليات الأساسية لاستعمال الرقمنة لغرض تعزيز العلاقات التجارية الخارجية.

الكلمات المفتاحية

تكنولوجيا المعلومات و الاتصال , الرقمنة, الكفاءة الرقمية, الفجوة الرقمية

تصنيف JEL: Q12,D56 ,

Corresponding author: SIAMER Hadjira, siamerhadjira@gmail.com

1-Introduction

Since the massive arrival of the internet in the 2000s, the application of information and communication technologies has become indispensable and irreversible, indeed it is essential to ensure an adequate environment and a successful digital revolution, and to make themselves ICT must be available and used in an effective and efficient way in the different sectors of the economy

(production, marketing) and by the various economic actors namely companies, households and the state, while using information provided electronically by data bases seeking better cost control to maximize profits. This has led to the promotion of new business models and the considerable improvement of existing models.

In Algeria, since the spread of the internet bubble in the world, the authorities have put in place a public policy aimed at the creation of technological zones in order to succeed in a digital transition in the country and draw profiles of their use in the different economic sectors.

We try in this article to address the digital transformation processes in Algeria and its effectiveness by answering the following problem:

- **How to successfully digitize effectively and benefit from its opportunities?**

2-Digital transformation

The digital transformation is the phenomenon of mutation linked to the rise of the digital, it is considered as an important step for the removal of the material and physical support of the various economic processes, aiming to reduce the costs, and thus to maximize the profits. That said, the digital transformation is the integration of information and communication technologies in the various action plans of economic and social practices.

Digital transformation is the determination of the characteristics of an installation of a new economy based on a better mastery of technical relations, and it's in this perspective that economic actors must learn:

- Digital driving (mastery of the different stages of digitization): the concept of digital driving refers to the understanding of two traits of the use of ICT: the first is material that is summarized and corresponds to the way in which the different interfaces are handled, and the second is cognitive and corresponds to the skills used to make its ICT useful, and the way in which a situation is developed (frequent breakdowns...);
- To coordinate with ICTs (ICTs contain technical and social rules and their conditions of use) : control and use structures that allow execution according to criteria that are considered an important step for the conduct of different economic activities, both in terms of use and organisation and in terms of direct consumption;

- To acquire expertise in the use of information and communication technologies, in fact, the latter do not stop progressing and developing particularly in their production and also in their use since the science of automatic information processing does not stop growing with the development of the scientific knowledge of the experts of the computer field.

3-Information and communication technology: a foundation for digitalisation

According to HERBERT Simon (Nobel Prize in Economics 1978) believes that information and communication technologies allow different economic agents (companies and households) to acquire all information in verbal or symbolic form, there will also be a computer-readable version.

They also help bridge the digital divide between developed and developing countries by optimizing management methods and incorporating a more appropriate database and management software.

Beyond the ICT industry, the latter are used as a means of digitising data; tools for exchanging, simulating and storing information in other vertical sectors.

The use of ICT is therefore essential in the various fields in order to achieve effective digitisation. Indeed they are used in commerce (inventory management and real-time inventory), in the field of energy (network), Healthy (remote monitoring of people) or smart electricity (CERIST analysis report 22/ 35).

This strong use of ICT in different areas of the economy requires a permanent and reliable availability both in terms of infrastructure and applications

4-The advent of ICT in Algeria

In the someway as the diffusion and use of ICT in developed countries and their major role in the various economic sectors, but also with the intention of reducing the digital gap, Algeria, considered as an emerging country in the age of digitization, It is essential to support the increased diffusion of ICT while supporting and financing investment in the productive industry of these technologies and in creativity and innovation.

4-1-Evolution and growth of information and communication technologies in Algeria

The exploitation and mastery of ICT is considered the main objective of developing countries (Lamri DOUDI) , in this case Algeria. In order to succeed the process of transition to the market economy the country to devote in recent

Title: Digital transformation in Algeria: a process still to be acquired

years means tending to support access to ICT easily, indeed the ICT industry is in full development especially in the mobile telephony market, the ICT market has enormous potential that the country must seize in order to foster the creation of a dynamic and competitive sector.

Table N°01: Ranking of Algeria in terms of ICT development

Year	2010	2012	2013	2015	2016	2017	2018- 2022
Ranking	114	114	114	113	106	102	Inavalable
Score	2.99	3.30	3,42	3.71	4.32	4.67	

Source: Statistics, Studies and Foresight Directorate, International Postal and Telecommunications Indices Report, available at:

<https://www.mpt.gov.dz/wp-content/uploads/2023/04/international-indicia-reportingYear-2022-.pdf>

In terms of ranking Algeria was able to gain a significant number of places in the ranking of the IDI (People's Democratic Republic of Algeria, 2022) from one year to another with a continuous improvement of the result of the index that measures the level of development of the telecommunication of the countries , and Algeria has not spared to support the development and modernization of ICT industry and services to meet the growing demand of the population and different economic agents, and this is due to efforts to support investments in ICT infrastructure and specify how countries lament high-speed networks and key technologies for digital transformation in the business world and public expectations, which translates into an improvement in its IDI index¹.

The indicators used to estimate the degree of ICT investment can be measured on a scale from 0 (poor performance) to 10 (better performance) composed of four main pillars:

- **Supply:** investment in ICT;
- **Demand:** e-commerce operations, number of broadband internet users, etc.;

¹ IDI is the main index that concerns the ICT sector in Algeria is a composite index designed to assess and compare the level of development within and between countries. The objective of this index is to track changes in ICT over time.

- **Experience:** experience in big data datacenters ... etc.;
- **Potential:** the costs of using tics; ICT patent

Table N° 02: ICT investment in Algeria

Year	2015	2016	2017	2018	2019	2020
Ranking	74/79	70/79	68/79	70/79	69/79	69/79
Score	22	25	27	29	31	32

Source: Directorate for Statistics, Studies and Foresight, op-cit

The impact of the incorporation of ICTs is only positive, if their development is not limited to the production of these ICTs but also to the ease of accessing and using them.

Table N°03: Algeria's ranking in terms of access to ICT

Year	2010	2012	2013	2015	2016	2017	2018- 2019
Ranking	110	107	107	110	102	98	Inavalable
Score	3.64	4.22	4.46	4.27	4.83	5.14	

Source: Directorate for Statistics, Studies and Foresight, op-cit

Table N°04 :Algeria's ranking in terms of ICT use

Year	2010	2012	2013	2015	2016	2017	2018-2022
Ranking	119	130	131	122	110	108	Unavailable
Score	0.55	0.67	0.73	1.52	2.92	3.38	

Source: Directorate for Statistics, Studies and Foresight, op-cit

It cans be seen that Algeria has achieved a significant step in access, use and investment due to a series of measures adopted to organize and protect the ICT market, including:

- The publication of Law 04-15 of 10 November 2004 concerning the expectations of automated data processing systems (STAD);
- The establishment of a national cybercrime prevention and control centre;
- Law 09-04 of 5 August 2009 on the prevention and fight against offences related to information and communication technologies and digital trust concerning crimes affecting certain digital automatic processing system², It is designed to deal with offences affecting the automated data processing system as defined by the Criminal Code and any other offences committed or whose execution is facilitated by a computer system or a communication system electronic. This law also provides for the possibility of putting in place measures to monitor electronic communications and to search computer systems in the case of the protection of public order.
- Accelerate the use of ICT through the development of government applications ;
- Promote the development of the knowledge-based economy;
- The acceleration of the coverage of the territory in fixed and mobile connection fast and high and very high speeds;
- The development of mechanisms and incentives to significantly increase access for economic agents to broadband equipment and networks;
- The establishment of a national agency to promote and develop technology parks (ANPT) in 2007. To monitor the implementation and planning of a national policy for the optimization and development of technology parks.

4-2- technical know-how in Algeria

The effective use of ICT is not to increase the stock of computer equipment and the internet, we no longer talk about the digital equipment divide but rather the cognitive and content divide (knowledge, the type of information we receive) this has led to a gap in skills, particularly technical and cultural.³

²The risks of using and accessing ICT are, however, considered high by users, with concerns about the risk of theft or identity theft, which partly limits usage, and the exploitation of personal data for fraudulent purposes.

³ The concept of digital divide was initially seen as the gap in telecommunications infrastructure access between countries. Over the years, this notion has evolved into a cognitive divide. The discussion on the digital divide dates back to the early 1990s with the differentiation between information-rich and information-poor, introduced by various official reports within OECD countries.

Table 05 : Classification of Algeria in terms of technological competence

Year	2010	2012	2013	2015	2016	2017	2018-2022
Ranking	103	98	98	93	87	80	Unavailable
Score	6.56	6.72	6.72	6.98	6.10	6.25	

Source: Directorate for Statistics, Studies and Foresight, op-cit

On the technical level, the performance actually observed is not always there (the development of the score is relatively low), especially for large-scale deployments of certain technologies for the general public. The introduction of information and communication technologies often requires technical skills, an understanding of available resources and financial sources.

For a more widespread and effective spread of information and communication technologies, it is essential to determine the positive externalities (network effect).

5- Barriers to digital transformation in Algeria

In Algeria the main obstacles to digital transformation are the lack of know-how and skills at the level of individuals, organizations or social groups, indeed these technologies are supposed to generate productivity gains while using them effectively and efficiently.

This main brake has given rise to other brakes, namely

- Rising research costs: Information and communication technologies can also be affected by crises due to the rising cost of research; New innovations are much more difficult and time-consuming to develop; in other words, in developing countries, the time taken to disseminate a technology is relatively long, and although the price of ICTs has fallen in all regions of the world, particularly in Algeria, there are still deep divides in terms of economic accessibility; as mentioned above, inequalities are no longer measured in

This divide was initially perceived as a gap in the development of telecommunications infrastructure and access to technology, as some countries felt compelled to help bridge the gap for less-equipped nations, in order to limit the inequalities resulting from technological lag.

terms of accessibility to the Internet and/or equipment, but rather in terms of knowledge and cognition.

- Sometimes innovations have a very short lifespan and can be quite costly, requiring a lot of technical knowledge.

The degradation of technological trust⁴: the remote use of information and communication technologies for collaboration drastically impacts the trust relationships between economic agents and organizations. The most important processes that manifest in the structure of trust, including the calculation of the benefits and drawbacks of the relationship with the other and the system. In an unstable and competitive environment, being able to constantly update the calculation and information necessary for trust, directing communication to maintain a competitive advantage over partners.

The trust as conceived by ANTONY Giddens (Antony, 1987) is part of the integral procedure of society's development; it is the result of men's efforts to overcome their fears so that they do not paralyze them, and it mainly requires ensuring the sustainability of their service or system.

- The expansion or inflation of data: the development of information processing encourages this movement, but due to the inflation of this data, there are often huge losses. The reuse of this data, particularly personal data, is therefore at the heart of economic issues to reduce development costs. However, this also raises questions about the thresholds for the exploitation of this data; the possibility of copying information (raw and digital content) must also be considered in terms of ownership and not fall into hyper-technology, as there is a risk of losing control of the tool. Digital technology is not suitable for everything, but rather adapted for the best use.

6- Conclusion

Despite all the efforts that Algeria has made in the field of ICT, the delay in the use of ICT and their integration into the Algerian economy persists. Indeed, the utilization of the potential of digitization by economic agents, both at the microeconomic and macroeconomic levels, presupposes the presence of technological infrastructure (electricity, computers, etc.) and human resources (technological skills).

The technological marginalization of developing countries, such as Algeria, cannot be reduced to mere access to ICT.

⁴The degree of trust in technology is called the technological coefficient, which introduces a flow of new inventions and applications of all kinds.

- Algeria's share in global scientific achievement is mediocre, with technological progress concentrated in OECD countries, wherein 2002, 86% of patents and 85% of scientific articles were produced.
- African countries are receiving decreasing amounts of foreign direct investment and are effectively excluded from the dissemination of information and knowledge based on a cognitive division of labor that favors regions of the world with more advanced research and development institutions, equipment, and personnel.
- Privatization of research (50-60%) in OECD countries and the strengthening of intellectual property rights through agreements on aspects of intellectual property licensing affecting businesses.
- The costs of technologies are becoming increasingly high, making their transfer practically impossible for the majority of developing countries. Additionally, the development of ICT requires mastery of a number of technical skills. With the privatization of research (50 to 60%) in OECD countries and the strengthening of intellectual property rights through the agreement on aspects of intellectual property rights related to trade, technologies become more expensive, making their transfer nearly impossible for most developing countries. Furthermore, the development of ICT requires mastery of several technical skills in different domains. The synchronization between different parts of ICT is sometimes too weak, while digital integration is at the core of new products and services. Providers of these new technologies must organize themselves to directly apprehend or through their partners (in an open innovation logic) new complementary expertise required. Interdisciplinarity should be encouraged and even go further with the integration of non-ICT skills (health, energy, etc.).

References

1. ANDRE ; TIANO, transfert de technologie industrielle ; paris 1981.
2. BENOT Aubert, the information technology and organization godain-marin, quebec ; canada 1997
3. DOMINIQUE Forey, l'économie de la connaissance new editing ; editing le decouverte , paris 2009 .
4. JEAN-LUC Metzger ; irrésistible extension du TIC au travail ; collection sciences sociales ; paris 2007.
5. Jérôme Vicente, les espaces de la net économie Ed Economica paris 2005.
6. J-L METZGER ou va le travail à l'ère du numérique collection sciences sociales paris 2007.
7. MICHEL Volle, économie des nouvelles technologies Ed Economica paris 1999.
8. Alain rallet ; commerce électronique ou électrification du commerce ; réseaux ; 2001/n2; article disponible sur ; <http://www.cairn.info/revue-reseaux-2001-2-page17.htm>.
9. Giddens A., 1987, La constitution de la société, Paris, Presses Universitaires de France, coll. "Sociologies", 474 p.
10. Maryann P. Feldman ; la révolution d'internet et la géographie de l'innovation ; revue internationale des sciences sociales ; n° 171; 2002.
11. Report of an expert group on the social aspects of new technologies, OCDE 1988.
12. Lamri DOUDI. (s.d.). Place de l'Algérie dans le monde des TIC. p. 1.

Web site :

1. Statistics, Studies and Foresight Directorate, International Postal and Telecommunications Indices Report, available at: <https://www.mpt.gov.dz/wp-content/uploads/2023/04/international-indicia-reportingYear-2022-.pdf>
2. MIKAEL Gleonne, confiance et usage des technologies d'information et de communication, consommations et sociétés, 2004, N°04, sic00001151, article available on : archivesic.ccsd.cnrs.fr/sic-00001151/document.