

Key Trends in ICT Supply and Demand in the Context of the Digital Economy Case Study: The state of Algeria

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Abstract :

This study aims to analyze and examine the supply and demand forces influencing the ICT market, specifically identifying Algeria's regional and international position within this market to assess its digital readiness. The study also provides practical insights on enhancing Algeria's competitiveness in the digital market in light of the current and emerging challenges posed by rapid technological advancements. Analytical-descriptive methodology was employed, utilizing the latest statistical data available in the region. The study reveals disparities between supply and demand in the ICT sector, with Algeria ranking moderately to poorly in supply-related aspects such as value addition, infrastructure, and digital innovation. On the demand side, Algeria shows positive signs with growth in market size and increased interest in digital technologies and solutions, particularly among individuals, presenting promising opportunities for investors to expand and contribute to sector development at national and regional levels.

Key words: ICT supply, ICT demand, Digital Economy, Algeria.

JEL classification codes:

O33, O14, L86, F63

Introduction

The digital economy has become a top priority for governments around the world during this important phase of the Fourth Industrial Revolution. This is evident in the widespread use of ICT in various economic and social sectors that impact people's quality of life. In order to understand the dynamics of the ICT sector, the interactive aspects of supply and demand in this sector were segmented based on the classification of the United Nations Economic and Social Commission for Western Asia (ESCWA). The available statistical data was applied to this model on international, regional, and local levels, in order to address the following main issue:

What is Algeria's international and regional position in the supply and demand of the ICT sector?

To fully understand the main issue, we need to address the following sub-questions:

- How much progress has Algeria made in each aspect of supply and demand related to the sector?
- What are the appropriate digital strategies to enhance the supply and demand in information and communication technology?

To answer the main question, we propose the following hypothesis:

Algeria is still at the beginning of its development in this sector, which hinders efforts to shift towards a digital economy. However, there are great opportunities for growth if the digital infrastructure is strengthened, investment is encouraged, and more attention is paid to digital innovation. This may contribute to improving Algeria's digital environment and strengthen its technological position in the global market.

We also propose sub-hypotheses as follows:

- The ICT sector is witnessing increasing growth in Algeria, especially from the consumer and commercial demand for technology. However, on the supply side, Algeria still needs more efforts to bridge the digital divide at the regional and global levels.
- Despite the efforts and endeavors of the Algerian authorities to adopt digital strategies to enhance the supply and demand aspects of ICT, they remain insufficient to achieve a complete and sustainable transformation in this sector.

Significance Of The Study

The importance of this study lies in highlighting the challenges and opportunities in the ICT sector in Algeria. It contributes to identifying digital gaps, assessing strengths and weaknesses, and the possibility of exploiting these data to achieve a qualitative shift in this sector. The study can help in guiding future efforts towards sustainable digital transformation and thus enhancing the digital economy, which will reflect positively on various aspects of economic and social life in the country.

Objectives of the Study

By analyzing the forces of supply and demand controlling the ICT market, the study aims to understand Algeria's position in this market from various perspectives at the international and regional levels. Additionally, it seeks to determine the extent of Algeria's readiness to accommodate rapid progress in this field and propose appropriate digital strategies to enhance its regional and global position.

Methodology

To answer the problem at hand, we will rely on the descriptive analytical method to explain and detail the subject of the study. This approach primarily focuses mainly on analyzing data, comparing phenomena, and drawing conclusions. In this article, we analyze the latest available data and statistics on Algeria's information and communication technology sector, issued by official bodies, the most important of which are the World Bank Group and the International Telecommunication Union. We then compare the progress achieved by Algeria in every aspect of the study at the regional and international level, aiming to provide a comprehensive, accurate and detailed vision of Algeria's position in ICT sector.

Previous Studies

Lahmar Abbes and Benzidane Hadj (2019) conducted a study titled *"ICT in Algeria: Reality and Prospects"*. In this study, the researchers focused on the digital environment in Algeria using a descriptive-analytical approach. The results of the study indicated that ICT in Algeria did not play its role in driving the economy despite the efforts and initiatives made in this regard.

Similarly, in the study *"The Digital Economy in Algeria: Prospects and Challenges"*, Hadji Soumya (2023) focused on assessing how digital technology is being integrated into economic activities in Algeria in order to achieve the technological

development of ICT. To this end, the study employed a descriptive and analytical approach. The results showed that the digital sector has great growth potentials in the future; nonetheless, it is operating with weak dynamism, and this is mainly due to the limited availability of support and funding mechanisms, as well as the insufficient development of innovative activities.

Another relevant study, *"Assessing the Reality of the Digital Economy in Algeria"*, by Abdelli Razika (2024), aimed to understand the reality of digital economy in Algeria, and analyze and highlight its main features. In this study, the researcher depended on a descriptive and analytical approach. The research results indicated that there were obstacles that hinder digital progress, and urged the dissemination of electronic culture, the promotion of Internet use by all departments, the development of e-commerce, the modernization of banking system and the expansion of e-government adoption.

In a broader context, Meng He (2020), in the study *"Intelligent Management of Unbalanced Supply and Demand of information technology Talents in Labor Market,"* studied the intelligent management system designed as a platform to provide information exchange between companies and job seekers using information technology. The findings indicated that the unbalanced supply and demand issue in the labor market can be well solved by the designed platform and alleviate the long-term information asymmetry issue in the labor market, providing a reliable intelligent management technology for the future supply and demand of talents in the labor market.

Based on the foregoing, the current research sheds light on the dynamics of supply and demand within the ICT sector and its implications for Algeria's digital environment. This analysis contributes to a deeper understanding of the forces shaping the digital economy and highlights key areas that must be strengthened to achieve technological progress in the global market.

Structure of the Study

The study plan was broken down into the following primary headings in order to cover every important facet of the subject:

1. Supply and Demand Aspects of ICT.
2. Information and communications technology supply aspects.
3. Information and communication technology demand aspects.
4. Digital strategies to promote ICT in Algeria.

1. Supply and Demand Aspects of ICT

The components of information and communications technology are generally divided into physical components (which include hardware and networks) and software components (which include programs and data), in addition to technical skills, which can be the subject of demand or supply in this sector. Their spread varies between different countries of the world, and this is due to the policies of some countries that were more proactive in investing in them than others. Therefore, the main indicator of ICT diffusion on the supply side is its share in total investment, i.e. investment in infrastructure and essential structures and providing the necessary equipment and software and trade in them, noting that investment is not the only measure of diffusion as it provides only a partial view. There are many other indicators that indicate the growing role of ICTs such as access indicators in the demand side so that the more people and companies that use communication networks, the greater the benefits expected from them. Over the past years, statistical offices have developed a wide range of ICT indicators based on internationally harmonized household and business surveys, and new indicators are increasingly being updated and added to study the economic impacts of ICT use in various areas so that analyzing the results can help improve performance, efficiency and effectiveness (Pilat, Nadim, & Schreyer, 2004, p. 12).

ESCWA, the United Nations Economic and Social Commission for Western Asia, has divided these indicators into trends that represent the supply and demand aspects of ICT in the digital economy. These trends are outlined in the table below:

Table 1: Supply and Demand Sides of ICT in the Digital Economy

Demand Side	Supply Side
Internet Usage by Individuals: Proportion of individuals using the Internet via computers, cell phones, and other digital devices	The added value of ICTs Contribution of the ICT sector globally to the trade of ICT goods and services
Business Use of ICT: Percentage of businesses using the internet	ICT Infrastructure: It includes infrastructures that provide internet access to the public and private sectors.
Government Use of ICT: Proportion of government services available online	Digital Innovation: Spending on research and development in the ICT sector

Source: Adopted from (ESCWA, 2018)

It is worthy to note that this classification was used to uncover the trends in supply and demand for ICT in Algeria in detail, both at the regional and global levels.

2. Information and Communications Technology Supply Aspects

The supply of ICT encompasses several basic aspects that integrate with each other to form a comprehensive system that helps meet the diverse needs of individuals and organizations by providing, developing, and managing hardware, software, and networks. The trends in supply can be measured based on the following aspects:

2.1. ICT Value-Added

There are several indicators to measure the added value of the ICT sector in the economy, such as the sector's share of GDP or the percentage of employment in technological jobs, but these statistics are still not available on a regional scale. Therefore, this aspect was studied by highlighting the exports of goods and services related to the ICT sector and their use in meeting the needs of customers.

ICT exports can be identified through the World Customs Organization's Harmonized System (HS), which captures all physical electronic equipment and devices such as computers and accessories as well as telecommunications network equipment, while software components include the various internally developed programs or applications needed to operate the physical components (OECD , 2024).

The following tables show data on exports of ICT goods and services at the local, regional and global levels, allowing for an examination of Algeria's position in international trade movement:

Table 2: Exports of ICT Goods (as a percentage of total goods exports) at the Level of Algeria, the Arab Region and the World during the Years (2015-2021)

Region	2015	2016	2017	2018	2019	2020	2021
Algeria	0	0	0	-	-	-	-
Arab Region	1,4	1,2	3,2	3	3,7	4	3,8
Global Average	11,9	12,1	12,3	12,5	12,5	13,4	13,2

Source:Data compiled by the authors from(The World Bank Group, 2025)

Table 3: Exports of Information and Communication Technology (ICT) Goods (as a percentage of total goods exports) for Algeria compared to the leading country in the Arab region, the African region, and the world (2017, 2021)

Region	Algeria (2017)	Emirates Leading in Arab Region (2021)	Rwanda - Leading in African Region(2021)	Hong Kong SAR, China - Leading in the World (2021)
Value	0	8,4	0,8	61,2

Source:Data compiled by the authors from(The World Bank Group, 2025)

ICT goods exports witnessed a stable growth in the world due to rapid technological development, increased global internet usage, and high demand for technological goods in various sectors such as healthcare, education, and services. The sector's exports peaked in 2020 at 13.4% of total goods exports due to the impact of the COVID-19 pandemic, which resulted in structural shifts in the ICT market and contributed to increasing demand for technological solutions to support remote work and provide online services.

The Arab region also recorded stable growth in ICT goods exports, but with low shares of total goods exports, ranging from 1.2 to 4 %, which is on the rise as Arab countries adopt policies to transform into a digital economy.

As far as Algeria is concerned, World Bank data indicates that the ICT sector has no added value in the global market. This may be due to several factors such as the country's high dependence on oil and gas exports in its trade balance on the one hand, and the lack of financing and investment in the ICT sector on the other. These factors reduce the abilityof local companies to develop products and services that are globally competitive.

Although Algeria has a promising development potential in the digital sector, the dynamism of the transformation remains relatively weak. This is mainly due to insufficient innovation activities and lack of financing formulas and mechanisms.This lag should be compensated by relying on the added value created by ICTs(Hadji , 2023, p. 186).

Table 4: ICT Services Exports (percentage of total services exports) at the Level of Algeria, the Arab region and the World during the Years (2016-2022)

Region	2016	2017	2018	2019	2020	2021	2022
Algeria	5,6	5,1	4	2,8	2,5	2,7	2,5

Arab Region	-	-	-	-	-	-	-
Global Average	10,2	10,2	10,8	11,5	15,1	15,1	14,1

Source:Data compiled by the authors from(The World Bank Group, 2025)

Table 5: ICT Services Exports (percentage of total services exports) for Algeria Compared to the Leading Country in the Arab Region, the African Region and the World (2022)

Region	Algeria (2022)	Kuwait - Leading in Arab Region (2022)	Mali - Leading in African Region (2022)	Ireland - Leading in the World (2022)
Value	2,5	43,5	39,9	55,2

Source:Data compiled by the authors from (The World Bank Group, 2025)

ICT services exports are an important part of the modern digital economy. On this basis, most countries of the world seek to expand the share of ICT services exports in total services exports, which are witnessing stable and regular global growth at rates close to those of goods exports in the same sector, as ICT services exports increased from 10.2% in 2016 to 14.1% in 2022.

In contrast to the global trend, Algeria recorded a decline in the proportion of ICT services exports in total services exports from 5.6% in 2016 to 2.5% in 2022. This decline can be attributed to the shrinking share of the sector at the global level in light of the intense competition of technology companies driving digital transformations in the modern world.

2.2.ICT Infrastructure

A country's ICT services can be measured by looking at the progress made in the infrastructure that allow access to the Internet. The most important key indicators for measuring infrastructure access include:

- Fixed broadband subscriptions (via wired networks).
- Mobile broadband subscriptions (via wireless networks).
- Internet bandwidth per capita(ESCWA, 2005).

These indicators were selected because they represent the volume and quality of digital services offered by the ICT sector to individuals, businesses and governments through various devices connected to wired and wireless networks.

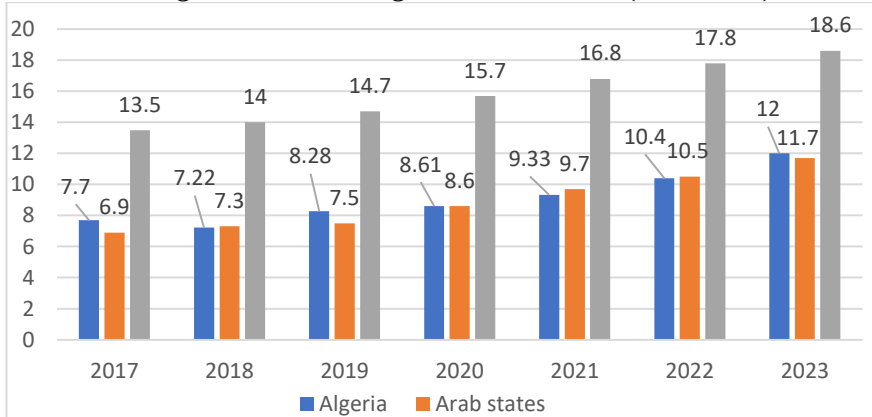
a. Fixed Broadband Subscriptions

This is the total number of fixed wireline broadband subscriptions with a download speed of at least 256 kbps, usually transmitted over a wired network with different technologies. This indicator is measured by the number of subscriptions per 100 inhabitants (OECD, 2024).

Fixed broadband subscriptions are the second-generation evolution of wired subscriptions in the number of fixed telephone lines but with higher speed broadband, which quickly evolved into high-speed fiber optic subscriptions.

The following figure summarizes the levels of fixed broadband access in Algeria via wireline subscriptions:

Figure 1: Number of Fixed Broadband Subscriptions (per 100 inhabitants) in Algeria, the Arab Region and the World (2017-2023)



Source: Data compiled by the authors from (ITU, 2025)

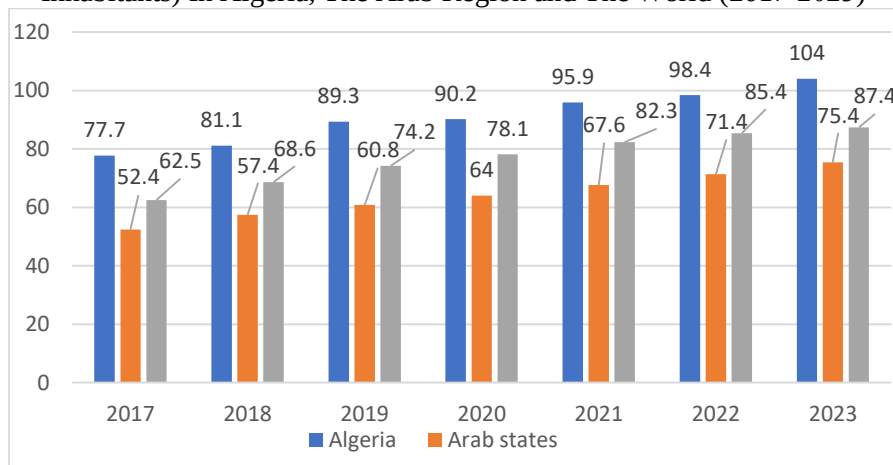
The figure above shows that the fixed broadband subscription in Algeria is comparable to that of other Arab countries, but it is still far below the global fixed broadband subscription rate, which reached double in some periods. Despite the importance of expanding fixed networks that support all access technologies in the ICT infrastructure (especially in the business and government sector), their use is still limited due to the tendency of individuals to use mobile wireless networks.

b. Mobile Broadband Subscriptions

It represents the total number of wireless mobile phone subscriptions with a data transfer speed of at least 256 kbps, transmitted over wireless networks, as measured by the number of

subscriptions per 100 inhabitants(OECD , 2024).It allows the use of the Internet and applications through phones and cellular devices by relying on 3G and 4G networks, while many major countries, such as China and the United States of America, have moved to use super-fast 5G networks. The following is a graphic representation of wireless subscriptions in Algeria, expressed in mobile broadband:

Figure 2: Number of Mobile Broadband Subscriptions (Per 100 Inhabitants) In Algeria, The Arab Region and The World (2017-2023)



Source:Data compiled by the authors from(ITU, 2025)

The figure above shows that Algeria recorded an increasing share of mobile broadband subscriptions, reaching a subscription rate of 104 out of 100 inhabitants in 2023, exceeding the global and Arab average.This increase is largely due to the widespread adoption of smartphones and the benefits of using mobile digital applications, which led to the growth of mobile broadband at a faster pace than the growth of fixed broadband.

c. International Internet Bandwidth Per Capita

As mentioned above, the number of fixed and mobile broadband subscriptions represents the volume of wired and wireless services offered, while the quality and speed of transmission of these services is measured by the international bandwidth in wired communications and the quality of the mobile network in wireless communications.Thus, fixed broadband (wired communications) and mobile broadband (wireless communications) subscriptions do not reflect the strength of the ICT infrastructure unless they are supported by high Internet bandwidth.

Table 6: International Bandwidth Per Internet User (Kbps) In Algeria, The Arab Region and the World During the Years (2017-2023)

Region	2017	2018	2019	2020	2021	2022	2023
Algeria	25,1	20,8	29,9	32,2	39,4	58,4	73,6
Arab Region	66,7	84,6	101	118	138	162	187
Global Average	84,7	108	135	154	198	235	276

Source:Data compiled by the authors from (ITU, 2025)

Table 7: The amount of international bandwidth per internet user (kbps) for Algeria compared to the leading country in the Arab region, Africa, and the world (2023)

Region	Algeria (2023)	Bahrain (Arab Leader2023)	Kenya (African Leader2023)	Hong Kong SAR, China (World Leader 2023)
Value	73,6 KB/s	1,08 MB/s	513 KB/s	31,1 MB/s

Source:Data compiled by the authors from (ITU, 2025)

It is clear from the two tables above that there is a gap in the quality of wired communications, as indicated by international bandwidth, between Algeria and the Arab region, with a difference exceeding to more than 3 times during the years 2018 and 2021 and 4 times with the rest of the world during the same period. This indicates that fixed broadband in Algeria is still at the beginning of its development, while the rest of the world, especially developed countries, dominate the global Internet. The same applies to the quality of cellular networks in wireless communications as a few countries dominate 5G services, such as China and the United States of America.

2.3.Digital innovation

The analysis of this aspect is based on the volume of digital products and services created by the economy in the ICT sector. Despite the absence of comprehensive statistical information, especially in the Arab and African regions, the global trend towards digital innovation can be inferred by examining the ratio of research and development spending to gross domestic product (GDP), as shown in the following table:

Table 8: Research and Development Spending as a Percentage of GDP (2017-2021)

Region	2017	2018	2019	2020	2021
Algeria	0,48	-	-	-	-

Arab Region	-	-	-	0.7	0.71
Global Average	2,15	2,23	2,29	2,48	2,58

Source:Data compiled by the authors from (The World Bank Group, 2025)

The shift towards a digital economy requires increased attention to research and development. Unlike developing countries, advanced nations seek to allocate significant amounts of their spending in the field of research and development in order to satisfy the growing needs of individuals in a highly competitive digital society. Among the economic factors that contribute to widening the digital divide is the difference in research and development spending between countries. The global average spending on research and development has been more than three times the spending of Arab countries, while the latest percentage recorded in Algeria is 0.48% of GDP, according to World Bank statistics.

Despite these wide disparities, global spending on the ICT sector remains relatively low overall, and it is expected that the contribution of countries in this sector will increase due to the expansion of the use of modern technologies in various fields.

The level of digital innovation can also be measured by relying on the Global Innovation Index issued by the World Intellectual Property Organization, which ranks countries annually based on several pillars related to ICT and innovation performance. The following table summarizes Algeria's ranking in the latest edition of the Global Innovation Index for the year 2023, which surveyed 132 countries.

Table 9: Country Rankings According to the Global Innovation Index 2023 (132 Countries Surveyed)

Country	Global Ranking	Institutions	Human Capital and Research	Infrastructure	Market Evolution	Business Evolution	Knowledge and Technology Outputs	Creative Outputs
Switzerland World leader	1	2	6	4	7	5	1	1
UAE Leader in the Arab region	32	10	16	15	25	23	59	50
South Africa Leader in the African region	59	88	84	68	45	61	56	63
Algeria	119	97	113	102	125	120	128	107

Source:Data compiled by the authors from(Dutta, Lanvin, León, & Wunsch-Vincent, 2023)

These rankings can be used to evaluate innovation capabilities and pinpoint areas of poor performance in specific subcomponents, as well as highlight the challenges that need to be addressed and

taken into account when implementing ICT strategies at any level. A poor ranking in certain indicators may point to areas that require improvement and development at the national level. However, the intricate and interconnected nature of the Global Innovation Index pillars makes it difficult to address all weaknesses immediately, as each pillar influences the performance of the others. Nonetheless, understanding the key dynamics and indicators can help in planning targeted and more efficient interventions (Labadze, 2019, pp. 31-32).

Among the most important challenges that prevent Algeria from progressing in this index, we find that the educational system is not adapted to the needs of the market, which leads to a lack of skills and brain drain to search for better opportunities abroad. Additionally, local companies face limited growth due to weak digital infrastructure and difficulty in obtaining the necessary funding for their growth.

This issue is compounded by a lack of a culture of innovation and development among companies as well as the absence of international cooperation in this field, which threatens the ability of these companies to grow. (Chabbi, Ababsa, & Cherefeddine, 2024, pp. 961-962).

Notwithstanding these challenges, Algeria has great potential to improve its ranking in the Global Innovation Index. By focusing on enhancing national innovation capabilities, Algeria can elevate its ranking to match that of other countries with similar economic profiles that have made notable progress in recent years, such as the Philippines, Iran, Vietnam, Pakistan, and others. This can be achieved through investing in infrastructure in general and strengthening and supporting human capital and research in particular (Chabbi, Ababsa, & Cherefeddine, 2024, p. 967).

3. Information and Communication Technology Demand Aspects

These are the aspects that reflect the diversity and great extension of ICT in our daily and professional lives. The demand varies according to the needs of end-users of technological services, through the use of devices, networks, and software, whether they are individuals, businesses, or governments. Below is an overview of the main aspects used to measure the demand for ICT:

3.1. Internet Usage by Individuals:

This indicator refers to the percentage of individuals who used the internet during a given period via fixed or mobile networks.

Table 10: Number of Individuals Using the Internet (In percentage %) In Algeria, The Arab Region and The World During the Years (2017-2023)

Region	2017	2018	2019	2020	2021	2022	2023
Algeria	47,7	49	55,8	63,5	72,2	74,8	76,9
Arab Region	46	48,7	53,8	60,4	64,7	67,4	68,6
Global Average	45,2	48,5	52,9	58,6	61,7	63,7	65,4

Source:Data compiled by the authors from (ITU, 2025)

Table 11: Number of Internet Users (In percentage %) For Algeria Compared to the Leaders in The Arab Region, African Region, And the World (2023)

Region	Algeria (2023)	Bahrain, Saudi Arabia, UAE (Leaders in the Arab region, 2023)	Seychelles (Leader in Africa, 2023)	Bahrain, Saudi Arabia, UAE (Leaders in the world, 2023)
Value	76,9	100	84,4	100

Source:Data compiled by the authors from (ITU, 2025)

We notice that internet usage in Algeria is showing positive growth and exceeds the global average. It is increasing steadily each year, with rates similar to those in the Arab region and the rest of the world. It is expected that the global internet connectivity rate for individuals will reach 100% in the coming years. This is the goal for countries worldwide to achieve digital inclusion that reaches all segments of society and fosters a digital culture similar to what is seen in Bahrain, Saudi Arabia, and the UAE.

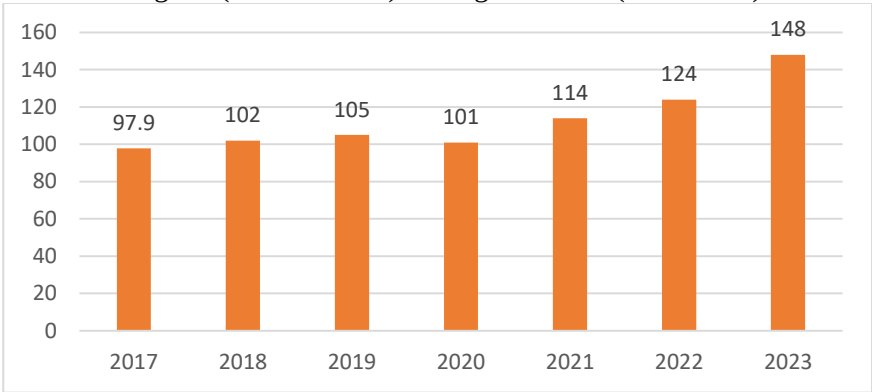
Although these statistics are not detailed and do not reflect the quality and nature of online activities, they are evidence of access to information, healthcare services, distance learning, e-commerce, financial services and other activities that are related to various aspects of individuals' quality of life and contribute to improving their living standards.

3.2.Business Sector Use of Information and Communication Technology (ICT)

The use of the internet by the business sector can be measured through indicators that include the size and quality of recorded activities of organizations in the field of ICT (cloud computing, e-commerce, Internet of Things, etc.). However, such data is rare and not up-to-date in developing countries. As a result, the focus is on

the indicator of business subscriptions to fixed broadband, which refers to the total number of public and private organization, institutions, and commercial companies that have contracts for fixed broadband subscriptions (with internet speeds of 256 kilobits per second or higher) via wired communication lines.

Figure 3: Number of Organization Subscriptions to Fixed Broadband in Algeria (In Thousands) During the Years (2017-2023)



Source:Data compiled by the authors from (ITU, 2025)

Table 12: Number of organization subscriptions to fixed broadband in Algeria compared to the leaders in the Arab region, African region, and the world (2023)

Region	Algeria (2023)	Egypt (Leader in the Arab region, 2023)	South Africa (Leader in Africa, 2023)	China (Leader in the world, 2023)
Value	148 thousand	567 thousand	263 thousand	91,9 million

Source:Data compiled by the authors from (ITU, 2025)

Figure 3 clearly shows that there is an increasing demand by organizations in Algeria for fast and reliable internet services to support daily operations and communication with customers and partners. The shift towards a digital economy and the growing dependence of many sectors on technology encourages organizations to subscribe to fixed broadband packages in order to promote productivity and efficiency.

The expansion of fixed networks is crucial for organizations because they support all access technologies within the ICT infrastructure. This is evident globally, as 54% of mobile data traffic was offloaded to fixed Wi-Fi networks in 2017. This creates a fertile digital environment for the growth of startups, allowing them to evolve into large tech companies with new models and concepts that

do not rely on mass production with limited resources but are instead based on intellectual capital(OECD, 2020, p. 61).

3.3.Government Use of Information andCommunication Technology (ICT)

The extent of the government's use of ICTs can be measured by relying on the E-Government Development Index (EGDI),which assesses the development of e-government in UN member states, and reflects the extent to which a country uses ICTs to enhance interaction with citizens. It is a composite measure of three important dimensions, namely: The availability of online services, telecommunications infrastructure and human capital. The closer the value of the index is to 1, the higher the country's ranking in e-government development(United Nations, 2024).

Table 13: E-Government Development Index in Algeria during the Years (2012-2024)

E-Government	2012	2014	2016	2018	2020	2022	2024
Global Ranking	132	136	150	130	120	112	116
Index Value	0,36077	0,31064	0,29991	0,42270	0,51730	0,56110	0,5956

Source:Data compiled by the authors from (United Nations, 2025)

Table 14: E-Government Development Index in Algeria Compared to the Leaders in the Arab region, African Region, and the World (2024)

Region	Algeria (2024)	UAE (Leader in the Arab region, 2024)	South Africa (Leader in Africa, 2024)	Denmark (Leader in the world, 2024)
Global Ranking	116	11	40	1
Index Value	0,5956	0,9533	0,8616	0,9847

Source:Data compiled by the authors from (United Nations, 2025)

We can observe from the tables above that Algeria started showing relatively good performance in the E-Government Development Index from 2016 onward. This indicates increased interaction between citizens and the government through digital platforms. The index value in the latest United Nations ranking reached 0.5956, which is still below the global average for the E-Government Development Index in 2024, set at 0.6382. Algeria was ranked 116th out of 193 countries in the same year, showing continuous improvement but still lagging behind South Africa,

which leads the African region and ranks 40th globally, and the UAE, which ranks 11th globally and leads the Arab region.

On a practical level, Algeria has recently moved to rely on ICTs as a means to develop the economy and achieve well-being. The country is working towards implementing digitalization across various sectors that are related to the lives of individuals. This is evident in the remarkable annual development in promoting e-government, indicating a practical application of digitization(Arribi & Boutarfa, 2024, pp. 53-54).

4. Digital Strategies to Strengthen ICT in Algeria

After highlighting the state of the digital economy in Algeria, and despite the efforts made by the government to create a competitive digital environment to drive the Algerian economy, the contribution of ICT to the GDP remains negligible. This raises questions about the delay and slow progress in the launch of the digital economy in Algeria. Undoubtedly, the lack of a clear, well-structured, and comprehensive digital strategy across sectors and government ministries has weakened the environment necessary for developing ICT in Algeria. However, digital transactions have spread among Algerian youth, particularly in areas such as finance, e-commerce, trading, and remote work. This puts the government in a challenging position to adapt to the digital realities, requiring it to restructure its traditional operations to keep up with the rapidly evolving digital landscape(Messiliti , Benzaama , & Benzidane , 2019, p. 52).

4.1.Enhancing ICT Supply Aspects

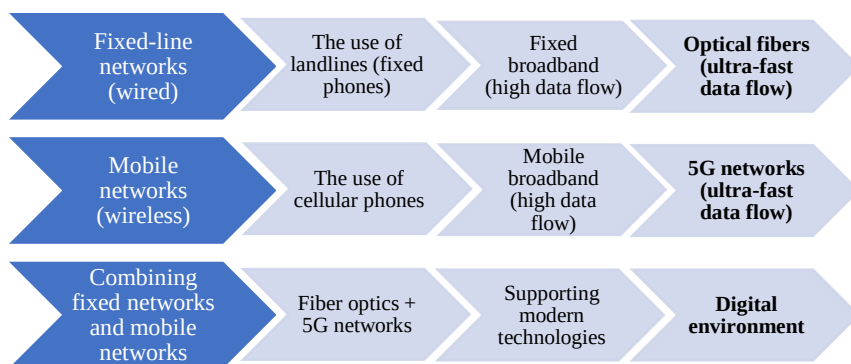
Enhancing the supply aspects of ICT can significantly increase the sector's added value, improve digital infrastructure, and maximize the benefits of technological innovations. Several areas can be focused on to boost technological supply in Algeria, including:

a- Establishing policies, regulations, and measures with specific, measurable, and evaluable objectives to create a digital investment climate suited to the region's characteristics. This requires adapting these policies to the reality by understanding the requirements and factors that attract digital investment in the country. Necessary reforms should then be implemented to provide the required digital environment for the growth of startups and attract high-tech foreign direct investments(Stephenson, 2020). This will also stimulate intra-

regional trade in technology goods and services and enhance the export capacities of the sector.

b– The national digital strategy should include key pillars for developing IT and communication infrastructure. This can be done by expanding broadband subscription, especially fixed broadband, which remains far from the global fixed subscription average. The focus should also be on the quality and speed of fixed broadband expressed in international bandwidth, as the study revealed a large gap in this indicator to catch up with the global average that exceeded four times in some periods. As for cellular networks in wireless communications, which are witnessing wide mobile broadband subscriptions, it is necessary to seek integration into 5G networks in order to achieve structural integration in fixed and mobile communication networks. This could create a homogeneous digital environment that connects local and global communications with appropriate efficiency and quality. It would also foster a digital environment that supports modern technologies linked to the Fourth Industrial Revolution, like cloud computing, the Internet of Things (IoT), blockchain, and more, as illustrated in the figure below:

Figure 4: Integration of Fixed and Mobile ICT Infrastructure



Source:Data compiled by the authors from (OECD, 2020, p. 61)

c– The average global spending on research and development is more than three times the spending of Arab countries. The most recent recorded percentage in Algeria was 0.53% of the Gross Domestic Product, according to World Bank statistics. Therefore, the digital plan should include government policies that support research and innovation development and place utmost importance on human

capital, which can impact other areas and contribute to their growth, through (Dehimat & Dehimat, 2022):

➤ Adapting education to meet digital age requirements and focusing on relatively rare talents that contribute to creating competitive advantages by leveraging knowledge to add value to institutions, especially since Algeria has a large number of young people skilled in technology.

➤ Connecting the scientific outputs of Algerian universities with national companies to promote a culture of innovation and development and enhance their competitive position.

➤ Focusing on opening diverse and direct funding channels to turn ideas into start-up projects, in addition to investing in venture capital, which increases the volume of national technological outputs.

4.2. Enhancing the Demand for Information and Communication Technology

The digital strategy on the demand side focuses on increasing digital interactions in among individuals, businesses, and e-government as follows:

a- Study data indicate that the internet connectivity rates in Algeria are similar to other countries and are continuously improving. It is crucial to make internet access easier and expand digital services to a broader range of people by taking various measures, such as expanding digital infrastructure, improving digital literacy, and enhancing network efficiency. However, the key to boosting individuals' access to internet services is reducing communication costs while maintaining affordable taxes and fees (West, 2015, pp. 9-10). The Broadband Commission for Sustainable Development has defined affordable broadband internet access as costing less than 2% of an individual's monthly gross national income in developing countries (ITU, 2024). Achieving this goal in Algeria would help narrow the gap between internet users and non-users and increase demand for digital services.

b- The levels of ICT adoption in the business sector vary by country, sector, and company. The use of the internet in business and industry depends on cost, speed, and security. Pricing and access conditions are crucial for both business-to-consumer (B2C) and business-to-business (B2B) interactions. There is a pressing need for policy initiatives to expand broadband internet access across different sectors. Countries lacking advanced bandwidth

technologies will face competitive disadvantages and slower adoption of e-commerce and other digital transactions. Research evidence indicates that productivity growth is highest in companies that integrate their organizational structure with ICT (OECD, 2001, p. 30). This is a key area for policymakers in Algeria to focus on to enhance the position of Algerian companies in an open and competitive global market.

c- The elements of demand (individuals, businesses, and e-government) interact through three important channels: these include partnerships between government entities, relationships between government and companies, and the relationship between government and individuals.

E-government helps to stimulate digital interaction between citizens, institutions or various government agencies by building unified digital identities for all citizens and institutions. These identities can be used across all applications, portals, and electronic entities within administrative, financial, and commercial sectors. Examples of this include the ability to achieve remote transactions such as document verification, financial transactions, dealing with electronic bills, electronic insurance, issuing licenses and other services related to aspects of individuals' lives and the proper functioning of institutions (Haldenwang, 2004, pp. 426-427). This requires expanding network connectivity for homes, institutions, public facilities, and commercial spaces to increase opportunities for digital integration anytime and anywhere, and to establish a digital culture for individuals and society.

Conclusion

Through analyzing the supply and demand forces governing the ICT market, the study concluded with an understanding of Algeria's position in this market from both international and regional perspectives.

On the supply side, it was found that Algeria is still in a growth and development phase in the ICT sector at both the international and regional levels. The country occupies mid to lower rankings in global classifications regarding the sector's value-added, digital infrastructure, and digital innovation. Algeria relies heavily on importing digital technologies and services from advanced countries, highlighting an urgent need to encourage investment, enhance local innovation, and develop digital skills among the youth.

On the demand side, Algeria is showing positive signs in terms of market size and growing demand for the ICT sector. Despite the challenges associated with infrastructure, we have recorded an increase in interest in digital technologies and technological solutions among individuals, companies and government institutions. This represents a promising opportunity for investors to expand in this market and contribute to the development of the ICT sector.

In conclusion, the study addressed the practical strategies that should guide government initiatives aimed at improving the digital environment in Algeria. This includes focusing on developing digital infrastructure, stimulating and supporting technological innovation, and expanding the role of e-government in order to achieve a successful digital transformation that enhances the status and competitiveness of Algeria's economy among the digital economies.

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