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Analysis of the Reality of Digitalization and the Digital Divide in Algeria Based on Selected International Indicators

تحليل واقع الرقمنة والفجوة الرقمية في الجزائر
اعتمادا على بعض المؤشرات الدولية

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Abstract:

The study aimed to examine the reality of digitization and the digital divide in Algeria from 2010 to 2024. It used international indicators such as the ICT Development Index and its sub-indices provided by the International Telecommunication Union to analyze the gap. The study revealed a positive trend in the measures measuring the level of digitization in Algeria over time, including the Network Readiness Index, the DiGix Index, and the IDI Index. Additionally, it demonstrated an increase in the magnitude of the disparity internally and in comparison to the world scale. The study underscored the critical need for a well-defined plan for digital transformation in Algeria. Such a plan is essential to guide policymakers and stakeholders in promoting economic and social progress and mitigating the risk of a digital divide between them and other nations.

Keywords: Digitalization, Digital transformation, Digital Divide, Information and Communication Technology (ICT).

الملخص:

هدفت الدراسة إلى الوقوف على واقع الرقمنة والفجوة الرقمية في الجزائر من 2010 إلى 2024. واستخدمت مؤشرات دولية مثل مؤشر تنمية تكنولوجيا المعلومات والاتصالات ومؤشراته الفرعية المقدمة من الاتحاد الدولي للاتصالات لتحليل الفجوة. وكشفت الدراسة عن اتجاه إيجابي في مقاييس قياس مستوى الرقمنة في الجزائر مع مرور الوقت، بما في ذلك مؤشر جاهزية الشبكة، ومؤشر DiGix، ومؤشر IDI. إضافة إلى ذلك، فقد أظهر ارتفاعاً في حجم التفاوت داخلياً ومقارنة بالمستوى العالمي. وشددت الدراسة على الحاجة الماسة إلى خطة واضحة المعالم للتحويل الرقمي في الجزائر. وتعد مثل هذه الخطة ضرورية لتوجيه صناعات السياسات وأصحاب المصلحة في تعزيز التقدم الاقتصادي والاجتماعي وتخفيف مخاطر الفجوة الرقمية بينها وبين الدول الأخرى.

الكلمات المفتاحية: الرقمنة، التحويل الرقمي، الفجوة الرقمية، تكنولوجيا المعلومات والاتصالات.

1. INTRODUCTION

The rapid advancements in information and communication technologies have fundamentally altered economic, social, and cultural life patterns. An emerging society has emerged, characterized by a growing dependence on knowledge and digital technologies. These findings have laid the foundation for what is commonly referred to as the digital economy. The rapid expansion of information and communication technology in industrialized nations has resulted in a huge disparity between them and numerous developing countries, commonly known as the digital divide. This spectrum of obstacles has hindered the progress toward a digital economy, making it imperative for developing nations to overcome these barriers to improve their economies and provide a prosperous future for their inhabitants.

Despite Algeria's notable advancements in the utilization of information and communication technology and the implementation of digitalization in economic, social, and administrative sectors, the country still faces a digital divide within its borders and worldwide. To evaluate the government's efforts to reduce this disparity, it is essential to comprehend the magnitude of the disparity between Algeria and the international world. The gap can be determined using specific measurements offered by technical international institutions, such as the ICT Development Index.

Given the information provided, the primary research inquiry of the study might be stated as:

What is the current status of digitalization and the digital divide in Algeria locally, and how does it compare to the global level?

The study postulates that the degree of digitization in Algeria falls short of the required benchmark when compared to other nations, resulting in a widening digital divide both domestically and globally. This research is important because it addresses the significance of the digital divide not only in Algeria but also in the global context of current economic matters. The digital divide not only separates developed and developing countries, but also creates distinctions within a single country among individuals, families, or regions. Furthermore, the significance of information and communication technology (ICT) and its profound influence on economic and social progress further emphasizes the relevance of this study.

-The study aims to achieve the following objectives:

-The objective is to gain insight into the level of digitization in Algeria by analyzing several international metrics.

-The objective is to assess and quantify the extent of the digital gap in Algeria, domestically and concerning the global context, from 2010 to 2024. This will be achieved by utilizing the ICT Development Index and its corresponding sub-indicators.

Objectives To offer proposals and recommendations to reduce the digital divide in Algeria.

To investigate the study question, we opted to utilize the descriptive-analytical

technique to examine the digital divide in Algeria. This approach centers on elucidating the phenomenon being investigated and scrutinizing associated data to arrive at a predetermined set of findings. The report employs data from the International Telecommunication Union (ITU) and the Algerian Ministry of Post and Telecommunications.

2. The conceptual framework of the digital divide

It's the rapid growth of investment and the widespread use of information and communication technology that have created a significant gap between countries with abundant information access and those with limited access. This discrepancy has led to the emergence of what is commonly referred to as the digital divide.

The digital divide refers to the disparity between industrialized and developing nations resulting from the information and communication revolution. It is measured based on the extent of one's basic understanding of the components of the digital economy, which is rooted in information technology, as well as the level of connectivity to the global information network (Jomouai, 2017, p. 335).

The digital divide, as defined by the International Telecommunication Union (ITU), refers to the inequality in access to information facilitated by communication technologies, including fixed and mobile phones, computers, the Internet, and broadband services. This division can manifest itself between nations that have achieved advanced levels of development and those still developing. It can also be observed within a particular geographical region or even a single country, where

disparities exist between rural and urban areas. Additionally, this division can be seen across different demographic groups based on factors such as age, gender, income, and race (ITU, 2017, p. 2).

It also signifies the disparity in the adoption of digital technologies among individuals and communities. This digital gap, arising from factors such as limited internet access, lack of technical know-how, poverty, and social and economic biases (OECD, 2001, p. 3), leads to certain individuals being deprived of the benefits of digital technology and online knowledge, while others thrive. This gap is evident in areas such as internet accessibility, proficient use of technology, and engagement in digital activities. Addressing this gap is crucial to ensure digital equity and inclusion.

As technology progresses, new digital disparities may arise, or the areas of concern may shift. Hence, it is imperative to consistently monitor and tackle these divisions to attain inclusion in the utilization of digital technology and mitigate digital inequities across individuals and communities. The primary categories of the digital divide encompass:

2.1 Access Gap:

The access gap pertains to the disparity in individuals' and communities' capacity to use digital technology and engage in online communications. The digital gap in this context is influenced by several factors, including the presence of digital infrastructure, such as wireless networks and fiberoptic communications, the expenses associated with communication and devices, and the requisite training and expertise for proficient utilization of digital technology;

2.2 Usage Gap:

The usage gap refers to the discrepancies in the utilization and advantages of digital technology among individuals and communities. Despite having a permit to access digital technology, certain persons may need more technical skills or understanding of the advantages that digital technology may provide. The potential causes for this issue include insufficient training and education, cultural and linguistic obstacles, or a lack of motivation to utilize digital technology effectively (Ali & Al-Hijazi, 2005, p. 25).

2.3 Content Gap:

The content gap pertains to the disparities in the accessibility and caliber of digital content across different languages and disciplines. Certain cultures and languages may need help with obtaining pertinent and valuable digital content in their mother tongue, impeding their complete comprehension and utilization of digital technologies.

2.4 Opportunity Gap:

The opportunity gap refers to disparities in individuals' and groups' access to and availability of digital technologies and their ability to engage in the digital economy. Economic and social factors can influence individuals' access to work, education, e-commerce, and participation in technology innovation (Gaber & Morsi, 2020, p. 271).

The ICT Development Index (IDI), established by the International Telecommunication Union (ITU), measures the digital divide. This composite index has multiple sub-indicators and is specifically developed to assess the progress of information and communication technology in various countries within a specific timeframe. The assessment evaluates the disparity in access to digital technology

between countries based on their levels of information and communication technology (ICT) advancement, capacity for ICT expansion, and aptitude for utilizing ICT to enhance growth and development. The indicators mentioned are as follows (ITU, 2022, p. 12)

a) Access Sub-Index:

- Proportion of homes equipped with a computer;

A proportion of households are equipped with internet connectivity;

The International Internet Bandwidth per user, a crucial metric, is measured in bits per second (bits/s).

- Mobile 3G network coverage, measured as the number of mobile cellular subscriptions per 100 population;

- The number of fixed broadband subscriptions categorized by speed tier (number of fixed telephone subscriptions per 100 inhabitants).

b) Usage Sub-Index:

- Internet penetration rate(%)

- Number of mobile broadband subscriptions per 100 individuals;

- This refers to the amount of data transmitted across fixed broadband internet connections per 100 individuals.

c) Skills Sub-Index:

- Average duration of formal education.

The awful enrollment ratio in secondary education.

The gross enrollment ratio refers to the total number of students enrolled in tertiary education, expressed as a percentage of the population in the corresponding age group.

2. The State of Digitalization in Algeria

Algeria is actively pursuing its strategic objective of creating a digital Algeria. It is

making significant strides in developing its information and communication technology (ICT) infrastructure to bridge the digital gap. In order to assess the level of digitization in Algeria, we depend on specific international metrics, which are described in detail below.

2.1 Digital Quality of Life Index:

According to a 2019 review by the World Bank, Algeria is ranked as the lowest among a list of 65 countries worldwide. Among Arab countries, it is foregone by Morocco, Tunisia, Egypt, and Iraq. According to a global poll containing 110 countries, Algeria's ranking dropped by six standings in 2022 compared to 2021. It now stands at 92nd place internationally, with a score of 0.32. The categorization was demonstrated using five criteria, as outlined by Aubouin (2022, p. 17):

-The acceleration of the internet connection.

-The cost of internet connection affordability.

-Protecting persons' personal information.

-The level of digital advancement per country in terms of cybersecurity.

- The advancement of e-government and the availability of a diverse range in each country.

Table (1): Quality of digital life in Algeria

Internet price		Internet speed	
Mobile	Cheapest	Broadband	mobile
broadband	broadband		
option	package		

0.0018	0.0049	0.025	0.0093
Availability of entertainment content	Data protection laws	Availability of electronic government	Comprehensive cybersecurity
0.1016	0.000	0.0336	0.328
0.1865	Overall index of digital quality of life DQL		

Source: (Surfshark, 2019, pp. 17-19)

The table illustrates the deficiencies in the digital quality of life. Algerian internet users, especially those accessing the internet through mobile phones, express dissatisfaction with the sluggish internet speeds caused by the absence of sophisticated internet communication technologies like fiber optics. Moreover, mobile internet costs are disproportionately high compared to the typical income level.

According to the Global Cybersecurity Index (GCI), which assesses the degree of trust and security in utilizing information and communication technologies, Algeria needs to meet the necessary criteria. The 2017, 2018, and 2020 index values were 0.432, 0.262, and 33.95, respectively. Notably, the index's maximum value shifted from 1 to 100 in 2020.

Algeria has made significant strides in the advancement and expansion of e-government. In 2022, it showed promising progress compared to 2020. The country's IDEG (E-Government Development Index) has seen a substantial increase since 2020, moving it from the group of nations with a medium index to the category of countries with a high index. Algeria's international ranking also improved, climbing 8 positions from 120th to 112th out of 193 nations

covered in the United Nations E-Government Survey. The index value rose from 0.51 to 0.56, indicating a positive trajectory.

2.2 The Global State of Digitalization Index

The Global State of Digitalization Index (DiGiX index) confirms the previous analysis of the substandard digital life in Algeria. This index is designed to evaluate the level of global digitalization and compare it among different countries. The 2020 results indicate a worldwide enhancement in digital barriers, as measured by the level of digitalization in 99 nations compared to 2019. Algeria was placed 85th in 2019, with a score of 0.30 points. According to the index, Algeria's ranking dropped to 87th out of 99 nations in 2020, scoring 0.31 points (Cámara, 2022, p. 8). This is seen in the figure below:

Figure 1: The State of Digitalization Worldwide



Source: (Cámara, 2022, p. 3)

Algeria is positioned in the maroon-colored zone, indicating its low ranking in the categorization. This region symbolizes the initial stage of the curves that depict the digital condition of countries, indicating the limited evolution of the digital sector in these nations. This strength can be attributed to the ungrammatical nature of digital services, internet availability problems, and exorbitant membership fees. In 2022, the monthly cost

of internet in Algeria was \$31.95 for a connection speed of 60 Mbps using ADSL technology. Moreover, there needs to be more investment in the digital infrastructure industry.

2.3 Network Readiness Indicator:

The Network Readiness Indicator, employed by the Global Information Technology Report on an annual basis, evaluates a nation's capacity to exploit the advantages presented by information and communication technology (ICT) while also exploring the digital divide across countries. This indicator includes the technical surroundings, the preparedness of critical social actors (individuals, businesses, governments), and the level of technology adoption among these actors (Gaber & Morsi, 2020, p. 273). Algeria's ranking in the 2022 Network Readiness Report by the PORTULANS Institute is 94th out of 124 countries, indicating a low performance. This reveals the deficiencies in every part of digital technology and the vulnerable information infrastructure, which obstructs the Algerian economy from attaining equitable growth in line with the demands of the global digital economy.

Despite demonstrating modest advancement compared to its 2019 ranking of 98th out of 121 nations with a score of 35.30, Algeria's score remains less than half of the Network Readiness Index values observed in sophisticated countries such as Switzerland, Sweden, and the United States. The current degree of progress falls short of the expected standard and underscores the digital disparity that Algeria experiences in comparison to other nations. Despite the presence of governmental determination and enterprising objectives in this area inside Algeria, it is crucial for all stakeholders, including the

audience, to play an active role in addressing this issue (Khamra & Khamra, 2020, p. 12).

Figure 2: Algeria's Ranking in the Network Readiness Index for 2022



Source: (Institute portulans, 2022)

The diagram depicts Algeria's position in the Network Readiness Index for the year 2022. Algeria ranks 94th out of 124 countries, indicating a notable deficiency in digital preparedness. This score indicates the country's inadequate performance in different aspects of digital technology, such as the technological infrastructure, stakeholders' preparedness, and technology utilization. Although there have been some advancements since 2019 (Figure 03), when Algeria was positioned 98th out of 121 countries with a score of 35.30, the country's present performance remains significantly lower than the average of industrialized nations like Switzerland, Sweden and the United States. Algeria continues to experience a digital gap despite the government's determination and ambitious goals to improve its digital infrastructure and capabilities .

Figure 3: Indicators of Economic and Technological Readiness for the Future in Algeria



Source: (Institute portulans, 2022).

Figure 3 depicts the metrics that measure the level of preparedness of Algeria's economy and technology for the future. These indicators include a range of evaluations of the country's economic and technical readiness, which affect its capacity to adapt to upcoming digital changes and thrive in the digital economy. The indicators encompass the degree of technical infrastructure, workforce preparedness, the scope of technology utilization in various sectors, and the economy's ability to innovate and adapt to digital advancements.

Algeria's ranking in these indicators reveals its strengths and weaknesses in economic and technical preparedness, aiding in the identification of areas that require reform and enhancement to prepare for the digital future.

2.4 ICT Development Index (IDI)

The ICT Development indicator, published by the International Telecommunication Union (ITU) from 2009 to 2017, is a composite indicator that aims to evaluate and compare the level of ICT development in different nations across time. The index was previously released every year until 2017 when a new approach for calculating the IDI was suggested for 2018. As a result, the release of the rankings for 2018 and 2019 has been postponed until 2022.

Table 2: Evolution of the ICT Development Index

Years	2010	2012	2013	2015	2016	2017	2018	2023	2024
Ranking	114	114	114	113	106	102	/	89.9	104.5
Indicator value	2.99	3.30	3.42	3.71	3.32	4.67	/	6	6.1

Source: Prepared by the researchers based on data from the International Telecommunication Union website, 2019.

Algeria has consistently climbed the ranks in the IDI classification over the years, demonstrating steady growth in its index score. The progress can be credited to the endeavors undertaken to enhance and update the ICT infrastructure and services to fulfill the growing needs of the population and diverse economic sectors.

In the newest assessment from the International Telecommunication Union for 2023 Algeria has shown notable improvement by moving up 14 ranks in the IDI. Algeria has increased in the rankings from 102nd to 88th among the 169 member countries of the Union. It currently holds a score of 77.8 points. This exceeds the average score of 47.4 points for Africa, the average score of 74.5 points for Arab countries, and the average score of 62 points for middle-income countries (Ministry of Post and Telecommunications, 2024).

3. Analysis of the Digital Divide in Algeria

Algeria has made significant advancements in information and communication technology in recent years. However, unlike other nations and within its own borders, the country continues to face a digital divide. As will be elucidated, the ICT Development Index (IDI) is utilized in Algeria to quantify this division.

3.1 The Digital Divide in the Composite ICT Development Index (IDI)

To assess the extent of ICT development, countries are categorized into four groups based on the levels of the composite IDI, as reported by the ITU. These groupings include high-level, upper-level, medium-level, and low-level countries.

Algeria has a medium degree of IDI

development, with a rating of 3.32 in 2016 and 4.67 in 2017. Table 3 depicts the disparity in access to digital technology in Algeria regarding the degrees of development indicated by the IDI value.

Table 3: Digital Divide Data in Algeria Compared to IDI Development Levels

The amount of change in the value of the digital divide	The value of the digital divide in Algeria compared to the IDI development levels for 2024	IDI value (maximum) for the year 2024		The value of the digital divide in Algeria compared to the IDI development levels for 2023	IDI value (maximum) for the year 2023	
-0.5	19.1	100	Very high	18.6	97.4	Very high
-2.6	14.1	95	high	16.7	94.5	high
0.1	7.4	88.3	middle	7.3	85.1	middle
-----	-21.3	59.6	low	-2.28	89.6	low

*The digital divide value was calculated by subtracting Algeria's IDI value from the average IDI value for its development level. Columns 2, 4, and 5 were calculated by the researchers.

Source: ITU, Measuring the Information Society, the ICT Development Index, Geneva2023,2024 .

According to Table 03 The digital divide value at the very high development level increased from 18.6 in 2023 to 19.1 in 2024, indicating a slight increase of 0.5. For the high development level, the digital divide value declined from 16.7 in 2023 to 14.1 in 2024, representing a significant reduction of 2.6. At the middle development level, the digital divide value increased marginally from 7.3 in 2023 to 7.4 in 2024, indicating a small rise of 0.1. For the low development level, the digital divide value dropped sharply from -2.28 in 2023 to -21.3 in 2024, although the exact change amount is not specified. This data highlights varying trends in Algeria's digital divide across different development levels, with improvements at

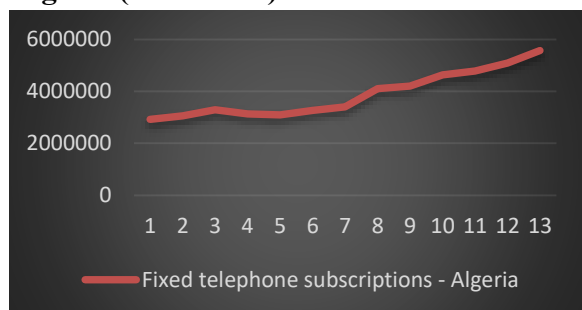
the high level and challenges at the very high and low levels. The Digital Divide in the Sub-Indicators of ICT Development (IDI)

3.1.1 Access to ICT Indicators

Gaining access to information and communication technology is the initial step in adopting ICT, directly highlighting the differences in digital capabilities among individuals, regions, or countries. As described in the theoretical section, the indicators in this group offer proof of the existing ICT infrastructure and people's ability to use it.

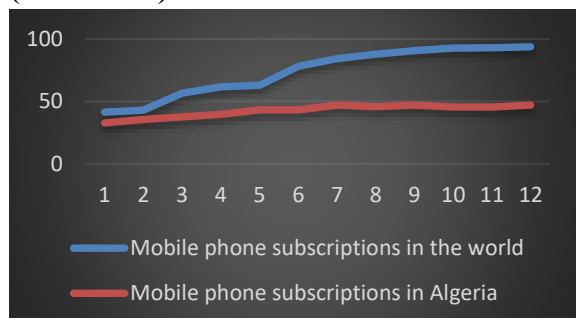
The disparity in digital access between Algeria and other nations, as well as the internal disparity, can be demonstrated by examining specific ICT access metrics, as shown in the following figures:

Figure 4: Fixed-Line Subscriptions in Algeria (2010-2022)



Source: Prepared by the researchers based on data available on the World Bank.

Figure 5: Mobile Phone Subscriptions in the World and Algeria (2010-2022)



Source: Prepared by the researchers based on data available on the International Telecommunication Union website.

The prior figures allow for the following inferences:

-Decrease in landline subscriptions in comparison to mobile phone subscriptions:

Globally and locally, the number of fixed-line subscriptions has declined compared to mobile phone subscriptions. The rise in this phenomenon can be attributed to individuals' growing preference for mobile phones, which are gradually supplanting landline phones.

-Surge in Fixed-Line Subscriptions in Algeria:

In recent years, Algeria has experienced a favorable increase in fixed-line subscriptions. As of the conclusion of 2022, the total count of fixed-line customers surpassed 5.5 million, reflecting a growth of 9.40% compared to the previous year, 2021. The proportion of fixed-line subscribers in the overall fixed-line network capacity is 62.56%. The graph illustrates a decreasing disparity between Algeria and the worldwide average regarding fixed-line subscribers, particularly from 2019 to 2021. The progress can be mainly attributable to substantial advancements in Algeria's telecommunications infrastructure in recent years, fueled by consistent rises in overall spending in the ICT sector .

The user did not provide any text. Examining fixed-line subscriptions by category indicates that residential subscriptions significantly outweigh professional subscriptions, constituting 92% of the total subscriptions after 2022. By the end of 2022, the predicted penetration rate of

fixed-line networks in households was around 64%, compared to 51% in 2017. This suggests households have far greater access to information and communication technology (ICT) than the professional sector.

A notable development in Algeria's ICT infrastructure: Cellular telecommunications services: The data illustrates a substantial surge in mobile phone subscriptions, driven mainly by the growing need for internet services. Telecommunications in Algeria are priced competitively in comparison to global rates. Mobile Internet costs \$0.48 per gigabyte, significantly lower than the global average of \$3.12 per gigabyte. Algeria has some of the most affordable mobile data prices due to its heavy reliance on less advanced broadband networks rather than mobile data networks. The nature of Algeria's economy significantly influences price determination, with a focus on ensuring affordability by keeping prices low.

The affordability of internet services in Algeria does not guarantee universal access, given that Algeria's average earnings are among the lowest in North Africa and the world. Consequently, impoverished communities integrate the Internet into their daily routines minimally, while the middle class faces unreliable digital connectivity due to financial constraints, often preferring other crucial expenditures.

The data illustrates a consistent upward trend in global mobile phone subscriptions from 2010 to 2022, surpassing the number of mobile phone subscriptions in Algeria. This is a result of the progressively rising global mobile phone usage rates. In 2018, the total number of worldwide connections rose to 8.16 billion. The global count of mobile phone subscribers is anticipated to reach 730

million by 2025. The main factors driving the ongoing growth in mobile phone subscriptions and usage are the affordable rates and the shift towards newer technology subscriptions like 4G, which provide faster internet speeds and broader internet offerings.

Economic levels, educational attainment, gender, and geographic location influence the internal digital access divide. Within Algeria, a discernible disparity exists in the availability of information and communication technologies, which is influenced by geographical location and gender. This is apparent from the metric measuring the proportion of households with internet connectivity. Although there has been a general rise in the number of households connected to the fixed internet, from 3.5 million in early 2020 to 5.4 million in 2023, and an increase in the proportion of households with internet access in Algeria, from 31% in 2010 to 66% in 2022, disparities still exist between urban and rural areas, as well as between the northern and southern states. Urban households had a higher internet connectivity rate of 61% in 2020, while rural areas had a lower rate of 42%. The significant difference in internet access between rural and urban areas can be attributed mainly to the exorbitant expenses associated with it. Many rural households, characterized by restricted money and poverty, find internet access overpriced and inaccessible.

3.1.2 Indicators of Information and Communication Technology (ICT) Usage

The indicators under this category demonstrate the intensity and utilization of information and communication technologies. There is a noticeable disparity

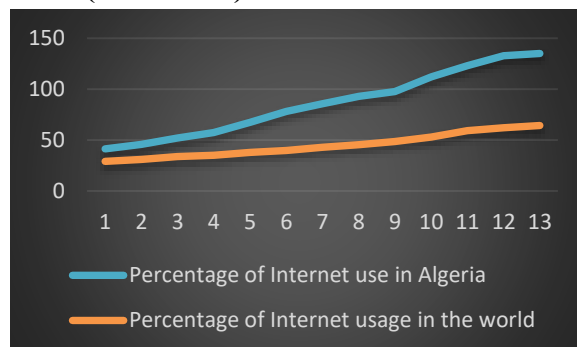
in the utilization of digital technology in Algerian society, indicating that some need more digital education skills. This could be attributed to their need for digital literacy or their non-involvement in the digital domain. The disparity between Algeria and other nations worldwide in this particular metric can be delineated as follows:

Figure (6) demonstrates a clear global trend where the percentage has more than doubled from 2010 to 2022, increasing from 29% to 66%. This considerable growth can be attributed to the Internet's substantial impact across several sectors. In recent years, Algeria has surpassed global averages in terms of internet usage rates. The percentage of internet users in Algeria has increased more than fivefold from 2010 to 2022, growing from 13% to 71%. The increase can be attributed to various factors, including the Ministry of Post and Telecommunications' diverse plans to restructure the sector and bolster telecommunications infrastructure. The introduction of new international cables, such as ORVAL – ALVAL, and the increase in operational capacity have improved internet speed in Algeria. These efforts, particularly within the sectoral policy focused on enhancing the quality of internet services and providing high-speed connections that meet the expectations of Algerian citizens, have contributed to this improvement.

In December 2022, the mobile internet connection speed surged to 10.94 Mbps, while the fixed internet connection speed rose to 10.83 Mbps, a significant increase from the previous 4 Mbps. This enhancement has resulted in a growth in the number of subscribers. Subscriptions ranging from 10 to 20 Mbps constituted 89% of the total, while subscriptions beyond 20 Mbps comprised 10.43%. It should be emphasized that all

subscriptions have speeds of more than 10 Mbps, except for certain professional subscriptions, which are limited due to technological constraints.

Figure (6): Percentage of Internet Subscribers in Algeria and the World for the Period (2010-2022)



Source: Prepared by the researchers based on data available on the International Telecommunication Union (ITU) website.

Regarding the gap in the fixed broadband subscription indicator

Globally, the number of fixed broadband subscriptions has been steadily increasing without any signs of slowing down. It has risen from 526 million customers in 2010 to 1,399 million users in 2022, with a growth rate increasing from 7.6% to 17.8%. Despite the reduced cost of fixed internet access, the diffusion of this indication in Algeria remains confined locally. The number of subscriptions surged to 900,000 in 2010 and then rose to 4,177,035 customers in 2021.

The surge in fixed and mobile broadband subscription rates in the last three years is related to the worldwide COVID-19 pandemic, which resulted in heightened internet and social media use. With the transition to remote delivery, various sectors, including education, public services, and healthcare, underwent a significant change, resulting in a distinct lifestyle that differed from before the pandemic. This change expedited the rate of expansion for fixed and

mobile broadband subscriptions.

Despite significant growth, Algeria now holds the lowest download speed for fixed broadband connections, with speeds ranging from 0 to 20 Mbps. According to the World Bank, the fixed broadband markets in North African countries, including Algeria, exhibit high market concentration levels and low competition levels. The absence of competition can be attributed to the failure to unlock segments of the broadband value chain. Private internet companies have not been granted access to the market in any of the Maghreb countries. In addition, IT companies, often of medium size, are prohibited from offering high-speed internet services directly to end customers through their infrastructure. Instead, they are still dependent on the obsolete infrastructure of existing operators.

Regarding active mobile broadband subscriptions: The global level of this indicator has consistently risen from 2010 to 2022, with the number of subscriptions increasing from 807 million in 2010 to 6,909 million in 2022. The increase in size results from the worldwide decrease in the expense of broadband services, including mobile and fixed options. Although mobile broadband subscriptions in Algeria have consistently risen from 2010 to 2021, there is still a disparity between Algeria's subscription rates and the global average, particularly in the present period. In 2021, the total number of subscriptions in Algeria amounted to 42,913,386. This gap can be attributed to multiple issues, including insufficient investment in expanding broadband service, the relatively high cost of smartphones compared to the average income, and weak digital skills among the less educated rural population. Hence, it is imperative to concentrate on augmenting demand by

providing cost-effective mobile broadband services and expanding pertinent content and services .

The International Telecommunication Union (ITU) conducted a recent study titled "The Economic Contribution of Broadband, Digitization, and ICT Regulation: Econometric Modeling for the Arab States." This study measured the effects of fixed and mobile broadband and digital transformation on the region's economy. The study found that globally, a 10% increase in fixed broadband penetration results in a 0.8% increase in GDP per capita. Additionally, the research demonstrated that mobile broadband has a more significant influence on the worldwide economy. Estimates suggest that a 10% rise in mobile broadband adoption typically leads to a 1.5% increase in Gross Domestic Product (GDP).

The study discovered that in Arab nations, a 10% rise in the use of fixed broadband services leads to a 0.71% gain in GDP per capita. Similarly, a 10% increase in the adoption of mobile broadband services resulted in a 1.81% increase in GDP per capita (ITU, 2020).

There is a growing trend towards mobile broadband as opposed to fixed broadband. Mobile broadband subscriptions have experienced a yearly growth rate of 32.5% over the past five years, while fixed broadband subscriptions have grown at 30.11% during the same period. This development can be attributed to the comparatively cheaper cost of mobile broadband, the gross income per capita, and the widespread accessibility of mobile services. In comparison, there has only been a minor rise in the number of fiber optic cable connections used to support fixed broadband.

3.1.3 Internal Digital Usage Gap

Algeria experiences a disparity in the

utilization of information and communication technologies in terms of geographical distribution and gender. This can be observed by examining the following:

The user did not provide any text. The internet usage indicator demonstrates a disparity in usage between genders. In Algeria, the proportion of female internet users is 42.9%, while the proportion of male internet users is 55.1%, resulting in a gender disparity of 12.2%. The gender disparity in internet usage is greater than the global gender gap, which stood at 6% in 2020, with 62% of men and 56% of women accessing the Internet worldwide .

The gender gap in accessing and using ICT is influenced by various factors, such as financial constraints preventing women from affording the costs, limited income, lack of technical knowledge and digital skills, scarcity of content addressing women's issues, language barriers, illiteracy, low education levels, social and cultural norms, time constraints due to household and other productive responsibilities, and low participation rates in technology education and professions (ESCWA, 2019)

Furthermore, a need exists for more utilization between urban and rural regions. The internet penetration rate in urban regions was 56.2% in 2018, compared to 34.1% in rural areas, resulting in a disparity of 22.1%. The discrepancy results from the topography, which presents a technical obstacle to providing coverage. Furthermore, there exists a disparity between genders in these fields. Within metropolitan regions, the percentage of young men utilizing the Internet was 61.7%, while the corresponding figure for young women was 50.8%. In rural areas, the prevalence rates were 41.9% for young men and 25.9% for young women.

4. CONCLUSION

The information mentioned above clearly indicates that the digital divide represents a disparity in accessing opportunities, contributing to information, knowledge, and networks, and limited utilization of the substantial developmental capabilities offered by information and communication technology (ICT). The IDI index is an exact and unbiased metric for assessing the worldwide progress of information and communication technology (ICT). By examining and analyzing specific indicators of the digital divide in the Algerian economy, it becomes clear that this difference is substantial both within the country and in comparison to the worldwide scale. Multiple inferences can be derived:

Algeria generally has a favorable standing in several worldwide indices that reflect its digitalization level. Nevertheless, it still lags behind worldwide standards in other ways.

The user did not provide any text. The access and usage metrics for ICT in Algeria are showing a positive trend due to the government's efforts to bridge the gap. These efforts include implementing numerous programs and allocating significant expenditures to grow the ICT sector.

Algeria has advantageous conditions and strengths, especially in terms of its current technical infrastructure, which can enable the country to participate significantly in ICT within the global information and knowledge economies. The internal digital divide is not just attributable to the absence of physical access to devices, technology, and the internet. This divide encompasses various dimensions, such as economic, social, educational, and cultural concerns. The widening difference across gender (female-

male) and geographies (urban-rural) within Algeria indicates social and digital isolation.

In order to address the digital divide and minimize its consequences, Algeria should formulate and execute a well-defined strategy to attain digital transformation. This will facilitate economic and social progress while minimizing the possibility of a technological gap between Algeria and other nations. This policy should also strive to mitigate the exacerbation of this disparity, which has the potential to result in the marginalization of Algeria and its economy from the global economy. Furthermore, it is imperative to deregulate the telecommunications and internet sectors in Algeria, establish collaborative projects between the private and public sectors in the realm of information and communication technology (ICT), reassess internet pricing to correspond with the financial capabilities of Algerian citizens, and allocate resources towards enhancing human resources, research and development, and education, particularly in the field of ICT.

5. Bibliography List :

1. Books:

- Nadia Ali and Nabil Al-Hijazi (2005), *The Digital Divide: An Arab Perspective on the Knowledge Society*, World of Knowledge Books. Series No. 318, Library of Alexandria, Egypt.

2. Journal article :

- Fatima Zahra Jomouai (2017), *The Reality of the Digital Divide in Algeria: An Analytical Study for the Period 2009-2014*, Journal of Economic Studies, Issue No. 04, Volume 1, pp. 333-357.
- Nadia Ali and Nabil Al-Hijazi (2005), *The Digital Divide: An Arab Perspective on the Knowledge*

Society, World of Knowledge Books. Series No. 318, Library of Alexandria, Egypt.

- Samir Ali Sheikh (2014), *Information Society and Digital Divide in Arab Countries*, Damascus University Journal, Volume 3, Issue 1-2, pp. 370-390.
- Manal Gaber Morsi Mohamed (2020), *The Digital Divide (Causes and Indicators)*, The Scientific Journal, Issue No. 69, Assiut University, pp. 249-291.

3. Seminar article:

- Bouamama Khamra, Taher Khamra (2020), *Analysis of the Digital Divide in Algeria Based on the Technology Readiness Index*, International Symposium on Outstanding Performance of Organizations and Governments, Fifth Edition: Performance of Institutions in the Digital Economy Era, February 4-5, 2020, University of Ouargla, Algeria.

4. Reports:

- ITU Publications (2022), *Global Connectivity Report 2022*, available at: www.itu.int/gcr2022.
- UN Economic and Social Commission for Western Asia (ESCWA) (2019), *Prospects for Promoting Gender Equality in the Field of Information and Communication Technology in the Arab Region*.
- ITU (2017), *Measuring the Information Society: The ICT Development Index*, Geneva.
- OECD (2001), *Understanding the Digital Divide*, OECD Publications, France.

5. Research Papers

- Mathilde Aubouin (2022), Determinants of the Digital Divide: Evidence from France, Document de Travail/Working Paper.
- Cámara, N. (2022), Digital Economy & Social Sustainability DiGiX 2022 Update: A Multidimensional Index of Digitization, Bilbao: BBVA Research, pp. 01-11.

6. Internet websites:

- Surfshark (2019), Digital Quality of Life, Global Research of 65 Countries' Digital Quality of Life, British Virgin Islands.
- Portulans Institute (2022), Future Readiness Economic Index, available at:
<http://portulansinstitutefrei.com/2022/report>.

6. Citations:

Ali, N., & Al-Hijazi, N. (2005). *The Digital Divide: An Arab Perspective on the Knowledge Society* (éd. Series No. 318). (L. o. Alexandria, Éd.) Egypt: World of Knowledge Books.

Cámara, N. (2022, june). *bbvaresearch*.
Récupéré sur www.bbvaresearch.com:
https://www.bbvaresearch.com/wp-content/uploads/2022/06/DiGiX_2022_Update_A_Multidimensional_Index_of_Digitization.pdf

ESCWA. (s.d.). 2019.

Gaber, M., & Morsi, M. (2020). The Digital Divide (Causes and Indicators)," The Scientific Journal. *Assiut University*(69), 249-291.

Index, F. R. (2022). portulans Institute.
Récupéré sur

<http://portulansinstitutefrei.com/2022/report>.

Institute portulans. (2022). *Future Readiness Economic Index*. Récupéré sur
<http://portulansinstitutefrei.com/2022/report>

ITU. (2017). *Measuring the Information Society*.
Geneva: The ICT development Index.

ITU. (2022). *Global Connectivity Report 2022*.
Récupéré sur www.itu.int/gcr2022

ITU. (2022). *Global Connectivity Report 2022*.
International Telecommunication Union
Publications.

Jomouai, F. Z. (2017). The Reality of the Digital Divide in Algeria: An Analytical Study for the Period 2009-2014. *Journal of Economic Studies*, 333-357.

Khamra, B., & Khamra, T. (2020). Analysis of the Digital Divide in Algeria Based on the Technological Readiness Index.
International Conference on Distinguished Performance of Organizations and Governments. 5.
Algeria: University of Ouargla.

Ministry of Post and Telecommunications.
(2024).

OECD. (2001). *Understanding the digital divide*.
France: OECD Publications.

Surfshark. (2019). *Digital Quality of Life 2019*.
Récupéré sur
<https://surfshark.com/media/dql2019/dql-slides.pdf>