The performance of the information and communication technology sector and the digital sector in Algeria and its impact on the international classification indicators related to them during the period spanning 2000 to 2023

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Abstract:

Our study aims to show the most important indicators of international classifications for the information and communication technology sector and the extent of their conformity with the performance of the sector's components in Algeria. We adopted the descriptive approach to describe and present the components and mechanisms of the sector and the analytical approach to analyze the most important indicators of international classifications through the extent of their conformity and application on the ground. We found that most of the classification indicators are unstable at most stages of the study. While some of them are positive, such as e-government development and electronic security, which are very acceptable, others are negative, such as the speed of Internet flow. The least to say about global connectivity from and to mobile is weak, compared to the countries under study. We came up with a set of recommendations for decision-makers at the sector level in particular and public authorities in general regarding the necessity of keeping pace with developments taking place mainly in the digital field and allocating significant budgets for research, development, and training for the sector.

Keywords: information and communication technology, digitization, international communications classification indicators, electronic security, e-government.

Introduction:

Algerian public authorities have been working on reforming and improving the quality of performance of the communications and digital sectors since the year 2000. This is due to the role they play in advancing the economy by accelerating the development process. They achieve this by facilitating the smooth flow of information in alignment with the ongoing expansion of organizational size and the escalating competition among them, as well as the increasing demand for it by the citizen in all aspects of his life. From this standpoint the state adopted the application of a policy of openness at the level of the telecommunications market. This was stipulated in General Law No. 2000-03 of August 5, 2000, which specified the general rules related to mail and telecommunications. This was clearly evident in the mobile phone technology market, which introduced the second generation 2G technologies in 2001, the third generation 3G in December 2013, and the fourth generation 4G in September 2016. The number of both fixed and mobile phone subscribers, the percentage of coverage and connectivity to the Internet, also increased. The development of the distribution of fixed Internet subscriptions according to the speed of flow, some of which was reflected positively and the other negatively on the value of international classification indicators for the information and communication technology sector. From this standpoint, we presented an overview of the performance of developments in the fixed phone market, mobile phone, fixed and mobile Internet until the end of 2022, and the latter's implications for international classification indicators for the telecommunications sector and the digital sector.

To delve deeper into this research, we pose the following problem:

The problem: To what extent is the performance of the information and communication technology sector and the digital sector reflected in improving international classification indicators related to the sector?

The following hypothesis is a tentative answer to the research question:

Research hypothesis: Most indicators related to international classifications of the information and communication technology sector are stable over the study period.

To enhance the clarity of the vision, it is essential to clearly define the objectives intended to be accomplished through this study.

Study objectives:

- Getting to know closely the most important traders active in the electronic and digital communications market in Algeria.
- Identifying the position of fixed telephony through its connectivity capacity and the number of subscribers, in light of the fierce competition of successive generations such as the first, second, third and fourth generations.
- Discussing the indicators of international classifications for the information and communication technology sector and assessing their conformity in Algeria.

Significance of the study:

Given the intense competition in the communications market and the global shift towards digitization in information and communication technology, it has become imperative for both public authorities in general and sector leaders, in particular, to catch up

with the global communication and digital trends. The significance of this study lies in its focus on evaluating the indicators of international classifications within the information and communication technology sector. This evaluation aims to assess the conformity of these indicators with the performance of the various components within Algeria's information and communication technology sector. Hence, it addresses the need for keeping pace with and modernizing this sector to stay in step with the rapidly changing global landscape.

Research Methodology:

To cover the topic, we used a descriptive approach, evident in describing and presenting the performance of the telecommunications and the digital sectors in Algeria. We also incorporated an analytical approach to scrutinize and evaluate indicators related to international classifications related to the sector.

1. Performance of the telecommunications sector and the digital sector in Algeria

1.1. Number of dealers and service providers active in the field of telecommunications

The following table shows the number of dealers and service providers active in the telecommunications market.

Table No 01: Number of dealers and service providers active in the field of telecommunications

	2018	2019	2020	2021	2022
Landline	**01**	**01**	**01**	**01**	**01**
Second generation mobile phone "GSM"	**03**	**03**	**03**	**03**	**03**
3G mobile phone	**03**	**03**	**03**	**03**	**03**
4G mobile phone	**03**	**03**	**03**	**03**	**03**
VSAT small aperture flooring	**03**	**02**	**02**	**02**	**02**
Global Mobile Private Communications via Satellite (GMPCS)	**01**	**01**	**01**	**01**	**01**

Source: Postal Indicators Report, Ministry of Post and Telecommunications, Directorate of Statistics, Studies and Foresight, 2022

The table provided above discusses the number of dealers and service providers operating in the telecommunications market spanning from the year 2018 until 2022. The number of active service providers in the telecommunications market reached 03 for each year, respectively, for each of the first generation, second generation, third generation, and fourth generation.Additionally, there is one active participant dedicated to the fixed telephone sector for the years mentioned above

2.1. Fixed telephone network

The development of the number of fixed-line telephone subscriptions in Algeria is analyzed as follows:

Table No 02: Development of the number of fixed-line telephone subscriptions in Algeria

Types of subscriptions	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Residential subscriptions	**3611735**	**3711765**	**4190162**	**4347326**	**4646659**	**5126100**
Professional subscriptions	**489247**	**452274**	**445055**	**438437**	**450400**	**450093**
Total	**4100982**	**4164039**	**4635217**	**4785763**	**5097059**	**5576193**
Total capacity of connection to the fixed telephone network	**7185592**	**7272466**	**7542246**	**7709344**	**7952885**	**8913003**

Source:

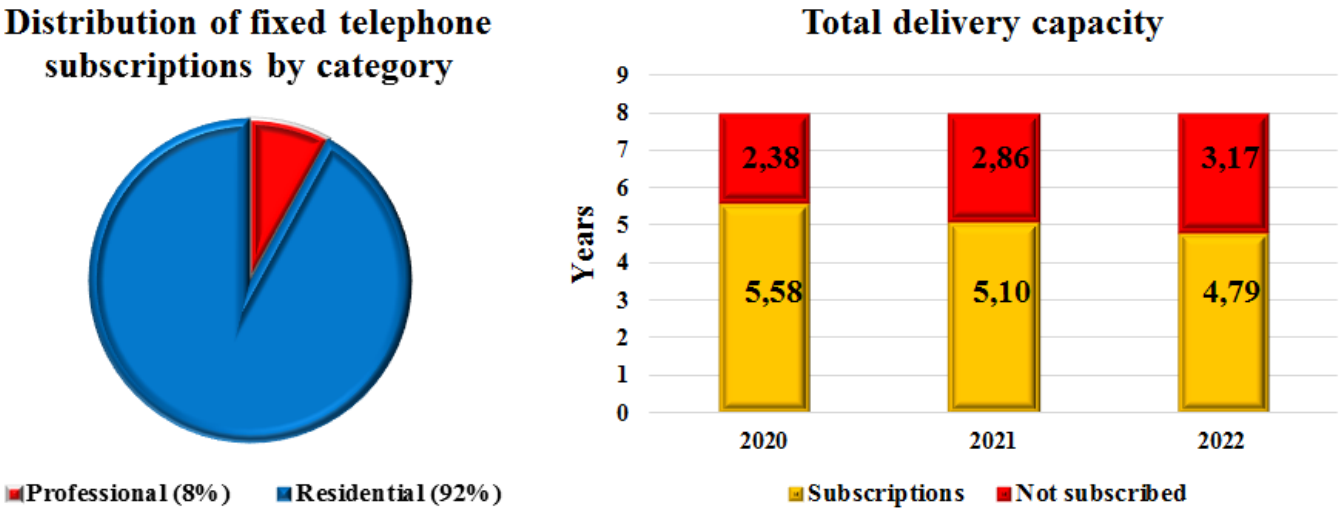
Postal Indicators Report, Ministry of Post and Telecommunications, Directorate of Statistics, Studies and Foresight, 2022

1.2.1. Development of the number of fixed telephone subscriptions in Algeria

The following table shows the development of the number of fixed-line telephone subscriptions in Algeria from 2017 to 2022

The advancement of fixed-line telephone subscriptions in Algeria witnessed a positive growth, as the total combined subscriptions, whether residential or professional, moved from about 4 million subscribers in the years 2017, 2018, 2019, and 2020, respectively, to reach a positive number of approximately 5 million subscribers in the year 2021, then further doubling to exceed 5 million subscribers in 2022. This strengthens Algeria's position in the international rankings related to the telecommunications sector, which will be discussed in the second axis.This is attributed to, for example, the incentive services provided by Algeria Telecom. The Algeria Telecom company called on its private customers to benefit from free calls from landline to local and national landline, along with calls to mobile networks at a price of 03 DZD/minute instead of the regular 08 DZD/minute, on the occasion of the blessed Eid al-Fitr holidays, indicating that it guarantees the continuity of its services at the level of commercial agencies during the Eid days of each year, as well as the symbolic prices of calls from and to fixed telephones. Notably, residential subscriptions dominate the landscape, reaching 92% compared to professional subscriptions, which reached 8%, out of the total distribution of fixed telephone subscriptions by category for the year 2022. This distribution is due to the previously mentioned reasons, as shown in the figure below:

Figure No 01: Development of the number of fixed-line telephone subscriptions in Algeria



Source: (Al-Istichraf, 2022)

1.2.2.Percentage of access to the fixed telephony network

The following table shows the percentage of access to the fixed telephone network

Table No 03: Percentage of access to the fixed telephone network

	2017	2018	*2019	**2020	***2021	****2022
Percentage of access to the fixed telephony network(for families)	**%51**	**%51**	**%56**	**%57**	**%59**	**%64**

Source: (Statistics, 2019, 2020)

- Calculated by the Statistics Directorate regarding the number of families for the year 2019: 8,257,740 families (source: National Bureau of Statistics)

**Calculated by the Statistics Directorate regarding the number of families for the year 2020: 8,415,094 families (source: National Bureau of Statistics)

***Calculated by the Directorate of Statistics regarding the number of families for the year 2021: 8,566,740 families (source: National Bureau of Statistics)

****Calculated by the Directorate of Statistics regarding the number of families for the year 2022: 8,714,199 families (source: National Bureau of Statistics)

The rate of access to the fixed-line telephone network for households witnessed a doubling effect, as shown in the table above. It moved from 51, 51, 56, 57, and 59 for the years 2017, 2018, 2019, 20120, and 2021 to reach 64% at the end of 2022. Notably, many customers use it at home or in residential offices primarily for Internetconnectivity. This trend indicates its access or use in direct calls to the aforementioned incentives, which strengthens Algeria's position in the international rankings related to the telecommunications sector. This point isdiscusseddeeplyin the second axis.

1.3. Mobile networks

The development of the number of subscriptions are discussed according to the payment method

1.3.1. Development of the number of subscriptions according to the payment method

The following table shows the evolution of the number of subscriptions according to the pre-and post-payment method

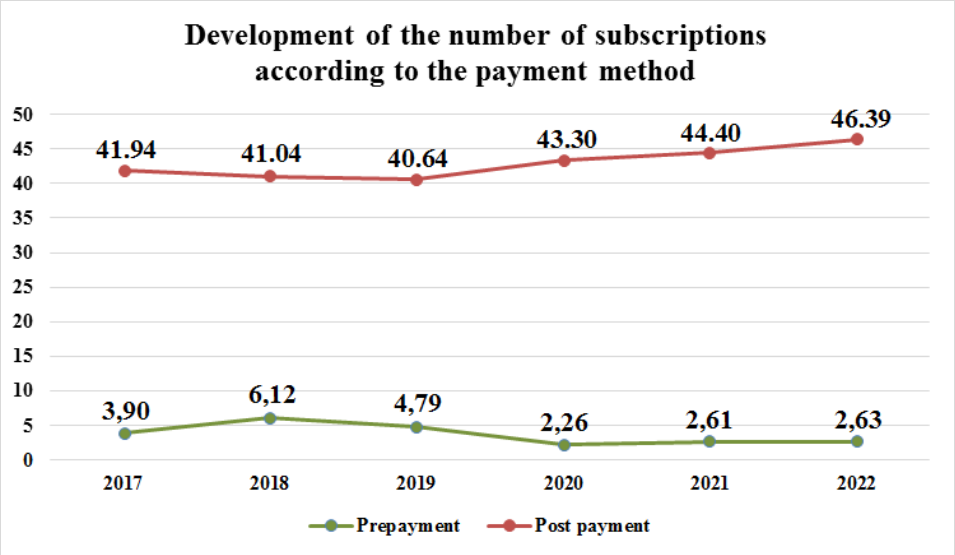
Table No 04: Development of the number of subscriptions according to the pre- and post-payment method

		2017	2018	2019	2020	2021	2022	Development rate 2021-2022
Number of subscriptions according to payment method	Pre-payment	41943543	41036380	40635183	43298886	44403382	46389101	4.47 %
	Post-payment	3902122	6117884	4790350	2256787	2612375	2629665	4.26%
Total		45845665	47154264	45425533	45555673	47015757	49018766	4.26 %

Source: (electronicweb)

The data presented in Table No. 4 provides a clearer vision illustrated graphically in the following forms:

Figure No 02: Development of the number of subscriptions according to the pre- and post-payment method



Source: (Electronic Web, 2022)

1.3.2. Number of subscriptions to the mobile phone network, distributed by customer

Market share analysis allows measuring the performance of dealers, the intensity of competition, or the dealer's position in one part of the market. Market share is calculated by calculating the ratio between the number of dealer subscriptions and the total subscriptions as shown in the following table:

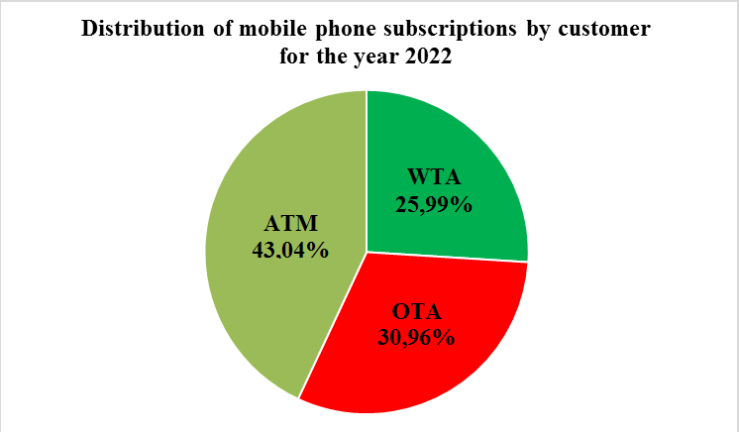
Table No 05: Number of subscriptions to the mobile phone network, distributed by dealer

Dealer	2017	2018	2019	2020	2021	2022	Development rate
Algeria Telecom (ATM Mobilis)	18365148	19106401	18633371	18974678	19829935	21098772	%6.40
AlgeriaEurastom (OTA) Telkom	14947870	15848104	14707625	14363102	14593618	15177875	%4.00
Wataniya Telecom (WTA) Algeria	12532647	12199759	12084537	12217893	12592204	12742119	%1.19
Total	45845665	47154264	45425533	45555673	47015757	49018766	%4.26

Source: (Electronic Web)

In terms of development, in 2022, the Algerian Telecom Company Mobilis "ATM" continues to dominate the market by recording the best increase in the number of mobile phone subscriptions of 6.40%, followed by the company Orascom Telecom Algeria "OTA" with an increase of 4.00%. With regard to the distribution of market shares among dealers, it still holds the lion's share in the market with a rate of 43.04% at the end of 2022 and confirms its leadership in the market for the seventh year since 2016, followed by Orascom Telecom Algeria "OTA" with a rate of 30.96%.

Figure No 03: Number of subscriptions to the mobile phone network, distributed by dealer



Source: (Electronic Web)

1.3.3. Number of subscriptions according to mobile technology

The distributions of mobile phone subscriptions, according to technology, are studied as shown in the following table:

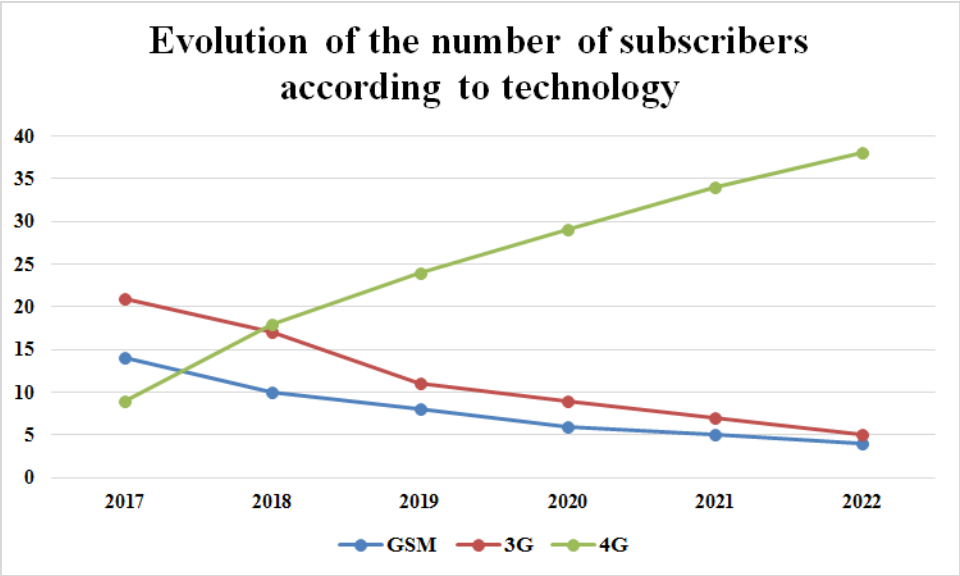
Table No 06: Distribution of mobile phone subscriptions by technology

Index	2017	2018	2019	2020	2021	2022
Number of second generation mobile phone subscriptions (GSM)	14385131	108116663	8514105	6783111	5235558	4260261
Number of third generation mobile phone subscriptions (3G)	21592863	17422312	11989157	9265682	7272657	5961291
Number of subscriptions to the fourth generation mobile phone (4G)	9867671	18920289	24922271	29506880	34507542	38797214
Total	45845665	47154264	45425533	45555673	47015757	49018766

Source: (Electronic Website)

Table 6 illustrates a rise in the number of mobile phone subscriptions with significant customer demand to purchase SIM cards through the use of new technology approved by dealers, such as second-generation GSM technology, third-generation 3G, and fourth-generation 4G. Based on the aforementioned technology, the number of mobile phone subscriptions increased from 45 million subscribers to 47 million for the years 2017 and 2018, to stabilize at 45 million subscribers for the years 2019 and 2020, respectively. Subsequently, there was an increase to 47 million in 2021 and 49 million in 2022. Notably, the surge in subscriptions was predominantly driven by fourth-generation (4G) technology, contributing 38 million subscribers and showcasing its superior quality. Following this were third-generation (3G), which had 5 million subscribers, and second-generation GSM, which came in last with 4 million subscribers. A visual representation of these trends is clarified in the figure below:

Figure No 04: Evolution of the number of subscribers according to technology



Source: (Electronic Website)

1.3.4. Percentage of population coverage by the mobile network

The percentage of population coverage by the mobile phone network are analysed in the following table:

Table No 07: Percentage of population coverage by the mobile network

Index	2017	2018	2019	2020	2021	2022
Second generation GSM	%98	%98.04	%98.04	%98.62	%98.31	%98.49
Third generation 3G	%90	%97.45	%97.72	%89.97	%98.18	%98.07
Fourth generation 4G	%30.49	%52.84	%53.63	%76.18	%79.89	%85.87

Source: (Electronic Website)

The mobile network for the second and third generations, “GSM” and "3G,” covers almost the entire population, with slight progress for the second generation at 98% over six years from 2017 to 2022, which indicates saturation and comprehensive coverage of all areas. We find that the third generation “3G” also covers several areas, while the fourth generation network “4G” covers more than 85% of the population by the end of 2022, which is an acceptable percentage that indicates saturation and coverage of many segments of society with this technology.

1.3.5. Mobile network coverage density (all 2G-3G-4G technologies)

The following table illustrates the coverage density of the mobile network

Table No 08: Mobile network coverage density (all 2G-3G-4G technologies)

	2017	2018	2019	2020	2021	2022
Mobile network coverage density	%108.6	%109.6	%104.7	%103	%104.4	%107.03

Source: Re-applied by the Directorate of Statistics. Source of data on population: National Bureau of Statistics, 2022.

Table No. 8 exhibits the density of mobile phone network coverage for all available technologies. The data indicates that the newer technologies, such as 2G, 3G, and 4G, have reached a stable level. This stability can be attributed to the saturation of the mobile phone market and a balanced distribution of these technologies among different regions.

1.4.world-wide-web

At this point, we will discuss the following:

1.4.1. Fiber optic network

The following table and figure analyse the fiber optic network

Table No 09: Actual and operational international bandwidth capacity

	2018	2019	2020	2021	2022
International Match Width (Megabit/s)	1136035	1528120	2417500	2867500	3757500

Source: (Electronic Website)

Figure 05: Evolution of international bandwidth in megabytes per second

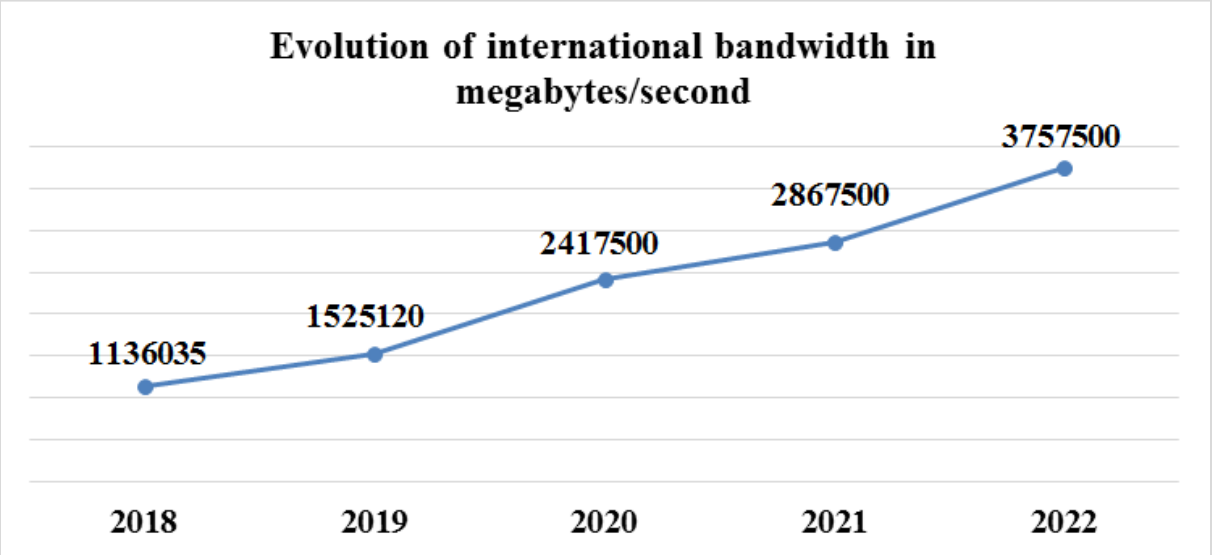


Table No. 09 and Figure No. 06 highlight the quick development of the fiber-optic network, a technology that uses long, thin strands of glass or plastic fibers assembled inside optical cables to transmit information as light pulses. International frequency, which has improved remarkably. It went from 1,136,035 MB per second to 375,750 MB per second for the years 2018 and 2022, respectively. This confirms and strengthens Algeria's position in the international rankings related to the telecommunications sector, which we will discuss later in the second axis.

1.4.2. Development in the number of fixed Internet subscriptions

Table No 10: Development of the number of fixed Internet subscriptions according to type of technology

	2017	2018	2019	2020	2021	2022
ADSL	2246918	2172096	2334005	2500080	2656942	2792695
Optical fiber	714	11369	43115	72314	165244	478172
Fourth generation fixed 4G LTE fixe	920244	861235	1191612	1204931	1340957	1423425
UMAX WIMAX	621	619	444	443	443	0
Custom links	34008	10781	11280	11360	11786	11554
Total	3202505	3063100	3580456	3789128	4175372	4705846

Source: (Electronic Website)

The figure and table above show that the number of fixed Internet subscriptions can be divided into two periods: the first period from 2017 to 2020, in which the number of subscriptions reached about 3 million subscribers, and the second period, 2021 and 2022, in which the number of subscriptions increased to about 4 million subscribers, to which ADSL subscriptions contributed in a large proportion. Similar to the rest of the technology used with a lesser contribution to the 4G LTE fixe and very weak percentages for both FTTX and WIMAX fiber optic technology.

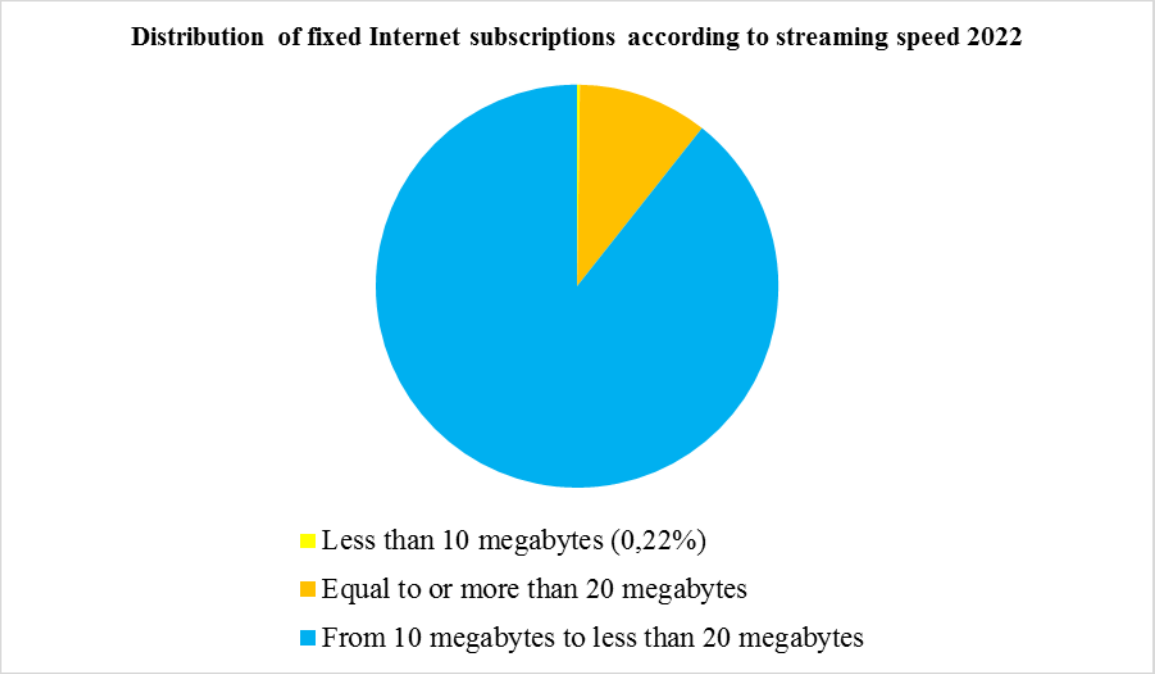
1.4.3. Distribution of fixed Internet subscriptions according to streaming speed

Table No11: Distribution of fixed Internet subscriptions according to streaming speed

Index	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Subscriptions less than 10 MB	2282237	2199194	2385257	2576105	68577	10321
Subscriptions from 10 MB to less than 20 MB	920268	861301	1191875	1205611	3621969	4204916
Subscriptions equal to or greater than 20 megabytes		2605	3324	7412	484826	490609
Total	3202505	3063100	3580456	3789128	4372175	4705846

Source: (Algeria, www.algerietelecom.dz)

Figure No 06: Distribution of fixed Internet subscriptions according to streaming speed



Source: Prepared by the researcher using the reference: Algeria, www.algerietelecom.dz.

From 2017 to 2022, the number of fixed internet subscriptions based on flow speed increased from 3 million to 4 million. The majority of these subscriptions (99.78%) were for speeds between 10 and 20 megabits per second, while only a small percentage (10.43%) were for speeds greater than or equal to 20 megabits per second. This is because higher speeds come at a higher cost, making them less accessible to the general population. The number of subscriptions for speeds lower than 10 megabits per second was only 0.22%, likely because such slow speeds do not meet the needs of Algerian citizens.

1.4.4. The development of mobile Internet subscriptions

Table No 12: Development of mobile Internet subscriptions by type of technology

Index	2017	2018	2019	2020	2021	2022
Number of 3G mobile Internet subscriptions	21592863	17422312	11989157	9265682	7272657	5961291
Number of 4G mobile Internet subscriptions	9867671	18920289	24922271	29506880	34507542	38797214
Number of mobile Internet subscriptions	31460534	36342601	36911428	38772562	41780199	44757505
Mobile Internet Density*	%75	%85	%85	%88	%93	%97.72

Source: Recalculated by the Directorate of Statistics, Population Data Source, National Office of Statistics (Algerian Demographics, Forecast 2017/2018/2019/2020/2021/2022).

The aforementioned table indicates a decrease in 3G mobile Internet subscriptions relative to 4G mobile Internet subscriptions. Compared to the fourth generation, which increased from 9.87% to 38.80% in 2017 and 2022, respectively, it decreased from 21.59% to 5.96%. This is a result of the widespread coverage rates throughout the country and the

technology in use. The combined percentage of mobile Internet density for the third and fourth generations was 97.72%, which is a very respectable amount. This validates and fortifies Algeria's standing in global rankings concerning the telecommunications industry, a topic we will address in the second axis.

2. The telecoms and digital industries' performance on related international classification indicators

The most significant international classification indicators about the information and communication technology sector will be examined and discussed, with particular attention paid to how much of them apply to Algeria's sector. This is as follows:

2.1. Development Index of information and communication technologies (ICT) for the International Telecommunication Union (ITU)

This index is recognized as a key indicator of industry interest and was published by the International Telecommunication Union from 2009 to 2017. It is a composite indicator created to aid in assessing and contrasting the relative levels of information and communication technology development over time, both within and between nations. Table No. 13 indicates that there has been a noticeable improvement in the indicator's value, confirming and strengthening Algeria's position among the studied countries, from 114th place with 2.99 points to 102nd place with 4.67 points. This is a result of the enormous efforts that the Algerian government has made to develop and enhance the infrastructure as well as the services that it offers the nation and its institutions. The number of dealers and service providers operating in the communications sector has doubled, which has positively impacted the fixed telephone network, the number of fixed telephone subscriptions in Algeria, the rate of access to the fixed telephone network, mobile telephone networks, the number of subscriptions according to pre- and post-payment method, the number of customer-distributed mobile phone network subscriptions, the number of subscriptions based on mobile phone technology, the fiber optic network, the number of fixed Internet subscriptions, and the number of fixed Internet subscriptions. As previously mentioned, the first axis explains how the development of mobile Internet subscriptions is dependent upon the type of technology, while the distribution of fixed Internet subscriptions is determined by flow speed.

Table No 13: Media and communication technologies development index

Year	2010	2012	2013	2015	2016	2017	Since 2018
Ranking	114	114	114	113	106	102	unpublished
Index value	2.99	3.30	3.42	3.71	4.32	4.67	

source: (www.itu.int, 2022)

2.2. E-Government Development Index:

A United Nations e-government survey, conducted every two years, aims to assess the development of digital government in the 193 member states of the United Nations by identifying their strengths, challenges, and opportunities. The latter, which evaluates the development of e-government at the national level, is an indicator of a composite based on the weighted average of three standard sub-indices:

A part related to the telecommunications infrastructure sub-index is based on data provided by the International Telecommunication Union.

A part of the human capital sub-index that utilizes data predominantly provided by the United Nations Educational, Scientific, and Cultural Organization (UNESCO).

A part of the online service sub-indicator, based on data gathered through an independent questionnaire on internet services.

Regarding e-government performance, Algeria has made great strides represented by the year 2022, as it was able to advance 19 places compared to the year 2010 and eight places compared to the year 2020 in the international ranking out of a total of 193 countries included in the study, with an index value equal to 0.56, as shown in Table No. 14. Knowing that (1 is the maximum value), this is due to the positive reflection of the performance of the telecommunications sector and the digital sector in Algeria that we discussed in the first axis.

Table No 14: Value of the e-Government Development Index

Year	2010	2012	2014	2016	2018	2020	2022
Index value	3.3181	0.3608	0.3106	0.2999	0.4227	0.5173	0.5611
Ranking	131	132	136	150	130	120	112

Source: (www.itu.int, 2022)

2.3. Global International Telecommunication Union Cybersecurity

The Global Cybersecurity Index was included in Resolution No. 130 of the ITU Plenipotentiaries "on improving the role of the Union in enhancing confidence and security in the use of information and communication technologies" and thus helping to raise the overall level of cybersecurity around the world. The index methodology was modified, making the maximum value of the index equal to 100 instead of 1. In this regard, Algeria achieved a qualitative leap of 36 places by moving the index from 0.262, 0.432, and 33.95 points between the years 2017, 2018, and 2020, respectively, as shown in Table No. (15).

Table No 15: Value of the ITU Global Cyber security Index

Year	2017	2018	2020
Ranking	68	108	104
Index value	0.432	0.262	33.95

Source: (www.itu.int, 2022)

2.4. Global Mobile Connectivity Index

The Global Mobile Connectivity Index program was developed to measure the main enabling factors for mobile Internet connectivity in many countries. The index analyzes the performance of 170 countries, representing 99% of the world's population, by examining the catalyst of infrastructure. The Algerian state has been able to embody this catalyst to some extent. In Table No. 1, the first axis shows that Algeria's ranking has declined from 105 in 2014 to 110 in 2021. This indicates that the placement of small-aperture floors, comprehensive private communications for mobile via satellite, VoIP dealers, Internet access providers, voice inquiries, and call centers are still insufficient. This is due to the negative reflection of the performance of service providers active in the telecommunications market about global communications for both the first generation and the second generation, the third generation, the fourth generation, and one activist expressed by the fixed line. Therefore, decision-makers must intensify efforts to improve the ranking by keeping pace with technology related to communications and digitization, especially at the international level.

Table No 16: Ranking and value of the global mobile connectivity index

Year	2014	2015	2016	2017	2018	2019	2020	2021
Ranking	169/105	170/103	170/102	170/102	107/170	170/108	170/112	170/110
Result	43.8	47.4	50.8	53.5	51.1	53.23	54.6	56.5

Source: (www.itu.int, 2022)

2.5. Global flow velocity index classification

The Global Flow Speed Index was created for companies and institutions looking to know network speed and quality better. In the case of Algeria, we can say, through the international classification of the global flow speed of the Internet, both mobile and fixed, that it is still far from the aspirations of the citizens on the one hand and the institutions on the other hand. As shown in Table No. (17), it ranked between 143 and 147 in terms of fixed Internet connection speed over the fourth quarter of 2022, which is consistent with its average ranking of 120th for mobile Internet connection speed. Despite the increasing demand for streaming speed, fixed Internet subscriptions, according to flow speed, moved from about 3 million subscribers in 2017 to about 4 million subscribers in 2022. Subscriptions of more than 10 and less than 20 megabits per second contributed to this in very high proportions, at 99.78% of the total subscriptions, and in a very high proportion and in a very weak proportion concerning the number of subscriptions that were less than 10 megabytes per second, at 0.22%. This is due to the weak flow speed, which hinders the requirements of institutions and the Algerian citizen. From this standpoint, the quality of the flow must be improved.

Table No 17: Global flow velocity index classification

Global Flow Velocity Index	September 2022		October 2022		November 2022		December 2022	
	Rating	Score	Rating	Score	Rating	Score	Rating	Score
Mobile Internet connection speed	120	11.02	123	11.14	122	10.77	119	10.94
Fixed Internet connection speed	143	11.14	145	10.91	147	11.00	147	10.83

Source: (www.itu.int, 2022)

Conclusion:

From the above, it can be asserted that the public authorities have opened the way for competition within the information and communications technology sector among the three operators, namely Mobilis, Orascom Telecom Algeria, and the National Telecom operator. This has been achieved by valuing the role of general rules related to mail and electronic communications, whose achieved outcomes are partly positive and partly negative, and those reached through an analytical evaluation study of the performance of the telecommunications sector and the digital sector in Algeria, which had positive and negative repercussions on the indicators of international classifications related to the sector. All this can answer and prove the aforementioned hypothesis. What has been noted is that most indicators related to international classifications of the ICT sector have displaced instability over the study period. This is reflected in the results obtained:

Results:

There were three service providers active in the telecommunications market for each of the first, second, third, and fourth generations of customers. Additionally, there was an activist represented by the fixed phone. The fourth generation outperformed the previous generations and occupied advanced ranks, as reflected in the number of subscribers. This is due to the quality of the service provided and the technology used in it.

The public authorities were able to connect residential and professional complexes to the fixed telephone network at very significant rates, thanks to the incentives provided. These incentives included free or symbolic prices for calls from and to the fixed telephone, as well as the necessity of connecting to it to use it to connect to the Internet.

Concerning the distribution of market shares among dealers, Algeria Mobilis still owns the lion’s share with a rate of 43.04% at the end of 2022 and confirms its leadership in the market for the seventh year since 2016, followed by Orascom Telecom Algeria with a rate of 30.96%, and 26% for Wataniya Telecom.

- Rapid development of the fiber optic network, which is a technical means of transmitting information, has improved remarkably, as shown in the first axis.

- The negative reflection of the performance of service providers active in the telecommunications market about global communications for each of the first generation, second generation, third generation, fourth generation, and one activist expressed by the fixed telephone.

- Regarding the telecommunications and digital sectors in Algeria, there have been both positive and negative effects on international indicators related to these sectors. The positive impact has influenced the rankings of the International Telecommunication Union's ICT Development Index, the e-Government Development Index, and the e-Security Index. This shows that Algeria has made significant progress. On the other hand, the negative impact has affected the global mobile connectivity index and the global flow speed index.

Recommendations:

- Decision makers must intensify efforts to improve the ranking by keeping pace with technology related to communications and digitization, especially at the international level.

- The quality and speed of communications flow related to mobile and fixed Internet must be improved.

- Allocating significant amounts of money for research and development to keep pace with developments in the field of information technology and communication.

- Holding training courses for the benefit of sector executives and workers, especially those related to the technical and technological aspects.

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