



The Development of Digital Communication Infrastructure in Algeria and Its Role in Supporting Digital Transformation

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Abstract ;

This study analyzes the development of digital communication infrastructure in Algeria from 2018 to the third quarter of 2025. It examines fixed and mobile telephony and Internet indicators using official secondary data.

The results show clear quantitative and technological progress in the telecommunications sector.

Fixed telephone subscriptions reached 7.50 million, mobile subscriptions 55.94 million, and Internet subscriptions 60.54 million. The study confirms the role of communication infrastructure in supporting digital transformation, subject to better service quality, wider fiber-optic coverage, stronger digital skills, and improved cybersecurity.

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Introduction

Digital transformation is no longer limited to the shift from paper-based transactions to electronic services. Rather, it has evolved into a comprehensive process whose success depends on the availability of a reliable digital communications infrastructure capable of ensuring connectivity, facilitating data flows, expanding Internet access, and linking individuals and institutions to the digital environment ; Every digital service requires an adequate communications foundation that enables its effective use, whether in e-government, electronic payments, digital education, e-commerce, digital banking services, or government platforms.

In Algeria, the telecommunications sector has acquired particular importance within the digital transformation process, as it provides the core technical foundation required for this transition. The sector has undergone successive changes since the telecommunications market was opened to competition and successive generations of mobile technology were introduced. These developments have expanded connectivity capacity and improved access to digital services. The legal framework governing postal services and electronic communications has also supported market liberalization and promoted better service quality for citizens.

Indicators from recent years show that Algeria's digital communications infrastructure has experienced sustained expansion and technological development, reflected in the growing use of fixed and mobile telephony and the increasing number of subscribers to Internet services.

This trend demonstrates the telecommunications sector's transition from merely providing conventional connectivity to supporting a broader digital environment that enables data exchange and the use of electronic services across various fields.

Internet-related data also reveal a significant shift in the nature of the communications infrastructure. Development is no longer associated solely with growth in the number of users, but also with the type of technology employed, connection quality, and the capacity of networks to accommodate the rising demand for digital services, particularly with the emergence of technologies better suited to supporting data-intensive applications, such as 4G and Fiber to the Home (FTTH).

Against this background, digital communications infrastructure has become an important research topic, as it provides a basis for understanding the relationship between the development of telecommunications services and the progress of digital transformation. The expansion of telephone and Internet coverage does not merely represent sectoral development. Rather, it reflects the growth of the technical environment required to make digital transformation applicable and accessible, particularly when such expansion is accompanied by improved network quality, higher data transmission speeds, and wider mobile Internet penetration.

Despite the improvements recorded in Algeria's telephone and Internet indicators, assessing the contribution of digital communications infrastructure to digital

transformation requires an analysis that goes beyond the direct presentation of statistical data. The issue is not limited to the growing number of subscribers, but also concerns the extent to which these indicators create the practical conditions necessary for using digital services, expanding digital inclusion, reducing disparities in access, and strengthening the readiness of individuals and institutions to engage with digital applications.

From this perspective, the study addresses the following research question:

How has the development of Algeria's digital communications infrastructure contributed to advancing the country's digital transformation process?

The study is based on the following main hypothesis:

The development of Algeria's digital communications infrastructure contributes to advancing the digital transformation process by expanding access to telecommunications and Internet services and improving the readiness of individuals and institutions to use digital applications. The significance of the study lies in its examination of digital communications infrastructure as a fundamental basis for supporting digital transformation in Algeria. The expansion of digital services cannot be achieved without reliable telecommunications and Internet networks capable of connecting individuals and institutions to the digital environment.

Its scientific significance lies in examining the relationship between the development of telephone and Internet services, on the one hand, and digital transformation readiness, on the other, using measurable

sectoral indicators such as fixed telephony, mobile telephony, fixed Internet, mobile Internet, 4G, and Fiber to the Home (FTTH).

From an applied perspective, the study helps identify the areas requiring further support within the telecommunications sector, particularly the improvement of network quality, the expansion of Internet access, the reduction of the digital divide, and the strengthening of individuals' and institutions' capacity to use digital applications.

Study Methodology

The study adopts a descriptive-analytical approach, as it enables the description of the development of Algeria's digital communications infrastructure and the analysis of its implications for advancing the digital transformation process. This is achieved by tracking indicators related to fixed telephony, mobile telephony, fixed Internet, mobile Internet, and modern communications technologies such as 4G and Fiber to the Home (FTTH).

The study draws on official secondary data issued by the Ministry of Post and Telecommunications, particularly the report on the development of telecommunications service indicators for the first half of 2023. This sectoral report provides quantitative data on the development of telecommunications and Internet services in Algeria.

These data are analyzed through temporal comparisons across the study period to identify growth trends in telecommunications services and assess the transition from conventional technologies to more recent ones. Particular attention is given to the implications of these indicators

for expanding digital access, improving connection quality, promoting Internet use, and strengthening the readiness of individuals and institutions to engage with digital applications.

The study links the development of digital communications infrastructure, as the explanatory variable, to the advancement of digital transformation, as the dependent variable. This relationship is examined through a descriptive and analytical interpretation of the available indicators, without relying on econometric models. The nature of the data and the scope of the study require an approach focused on interpreting general trends and their developmental and digital implications..

2.1 The Conceptual Framework of Digital Communications Infrastructure and Digital Transformation

This section defines digital communications infrastructure and digital transformation, distinguishes related concepts, and explains the role of digital readiness and communications networks in supporting the digital transformation process.

1.1 The Concept of Digital

Communications Infrastructure Subtitle

Digital communications infrastructure refers to the networks, technologies, and platforms that enable data transmission, information exchange, and the connection of individuals and institutions to digital services. It includes fixed and mobile telephone networks, fixed and mobile Internet, transmission and reception equipment, data management systems, and platforms that facilitate communication and interaction between users and service providers. (providers, 2025)

Accordingly, digital communications infrastructure is not merely a technical component; rather, it constitutes an enabling foundation that supports the transition of activities and services from conventional to digital modes. ((Elia, Solazzo, Lerro, Pigni , & L. Tucci, 2024, p. 385)

The importance of this infrastructure is reflected in its connection to several essential functions, including providing connectivity, transmitting data, supporting digital platforms, and enabling individuals and institutions to use electronic applications. The literature indicates that digital infrastructure comprises both physical and organizational components, including physical infrastructure, information platforms, and smart applications that support the life cycle of digital services. From a social perspective, digitalization also encompasses new patterns of living and working, such as remote work, e-business, and digital services. (Liao, Li, Guo, & Li, 2026, p. 02)

1.2 The Concept of Digital Transformation.

Digital transformation refers to a broad process of change that relies on digital technologies to reorganize operations, develop services, improve performance, and expand channels of interaction with users. It is not limited to converting documents and transactions into digital formats; rather, it involves a deeper transformation in the way institutions and sectors operate by integrating technology, people, and processes to achieve better performance and deliver services that are more responsive to beneficiaries' needs.

(Elia, Solazzo, Lerro, Pigni , & L. Tucci, 2024, p. 382)

Recent literature emphasizes that digital transformation is a multidimensional concept because it integrates technological, strategic, operational, and leadership dimensions. It also goes beyond automating existing practices to bring about changes in the scope of business activities and the way value is created.

(Elia, Solazzo, Lerro, Pigni , & L. Tucci, 2024, p. 381) It is therefore viewed as a process of digitally enabled organizational renewal rather than merely the introduction of technological tools within an institution.

(Busulwa, 2023)

2.2 Distinguishing Digitization, Digitalization and Digital Transformation

Recent literature distinguishes among three closely related concepts: digitization, digitalization, and digital transformation. Digitization refers to converting physical elements, such as documents and images, into digital formats, allowing them to be stored, processed, and transmitted through digital means. Digitalization, by contrast, involves using digital and communication technologies to improve organizational processes such as communication, production, and procurement. Digital transformation encompasses both digitization and digitalization while also incorporating human capital, networks, and data-driven decision-making to bring about broader changes in activities and business models. (Elia, Solazzo, Lerro, Pigni , & L. Tucci, 2024, pp. 383-385)

From this perspective, the mere availability of technology is not sufficient to demonstrate the existence of digital

transformation. Such transformation requires the systematic integration of digital technologies into organizational processes, together with the human and organizational readiness necessary for their effective use. Digital transformation is therefore closely associated with the level of digital skills, institutions' capacity to adapt, the clarity of strategic direction, and the quality of the communications infrastructure that supports data transmission and service delivery. (S.Silva, Marujo, & Senna, 2026, pp. 2-3)

2.3 Components of Digital Transformation

Digital transformation comprises a set of interrelated components. The first is the strategic dimension, which reflects the purpose motivating an institution or sector to adopt digital transformation, such as improving service delivery, increasing efficiency, reducing costs, expanding access, or strengthening relationships with users. This dimension requires alignment between digital transformation objectives and the institution's or sector's overall strategy. (Elia, Solazzo, Lerro, Pigni , & L. Tucci, 2024, p. 384)

The operational dimension consists of processes, people, platforms, and partners. Processes refer to the activities affected by digital transformation, while people represent the actors who can either facilitate or hinder its success depending on their level of participation, skills, and readiness. Platforms encompass digital technologies, infrastructure, and data management systems, whereas partners refer to the entities that provide the expertise and technological solutions required to support the transformation

process. (Elia, Solazzo, Lerro, Pigni , & L. Tucci, 2024, pp. 384-385)

Digital transformation also encompasses a value dimension, reflected in the development of new digital services, improved performance, expanded collaboration, and more efficient use of resources. It further includes a risk dimension, particularly system security and data privacy, as the growing use of digital platforms and data requires effective network security management and clear rules governing data collection, processing, and use. (Elia, Solazzo, Lerro, Pigni , & L. Tucci, 2024, p. 385)

2.4 Digital Readiness as a Prerequisite for Digital Transformation

Digital readiness refers to the capacity of an institution or society to absorb digital technologies and use them effectively. Some studies define it as an institution's ability to seize opportunities, identify new resources, and leverage existing practices in preparation for digital transformation. It comprises digital assets, digital capabilities, and commitment to digital transformation, making it a broader concept than the mere possession of technology. (S.Silva, Marujo, & Senna, 2026, p. 02)

Within this context, human readiness emerges as a crucial requirement, since digital transformation cannot be achieved merely through the availability of networks and platforms. (S.Silva, Marujo, & Senna, 2026, p. 09) It also requires individuals who are capable of understanding technology, using it effectively, and adapting to its demands. Individual readiness therefore includes elements such as digital awareness, leadership support, digital

inclusion, digital skills, and the capacity for continuous learning. (Ndulu, 2023)

2.5 The Relationship Between Digital Communications Infrastructure and Digital Transformation

The relationship between digital communications infrastructure and digital transformation is reflected in the fact that the former constitutes a necessary technical prerequisite for the expansion of the latter. As telecommunications and Internet networks expand, data transmission quality improves, and communications technologies advance, individuals and institutions become increasingly capable of using digital services. At the same time, sectors become better positioned to adopt e-government, electronic payments, digital education, e-commerce, and remote services.

Digital communications infrastructure also helps reduce disparities in access, as the expansion of networks and platforms integrates wider population groups and geographical areas into the digital environment. It further strengthens institutional readiness by providing channels for data transmission and interaction with beneficiaries. From this perspective, examining the development of this infrastructure provides an entry point for understanding Algeria's readiness for digital transformation, since such transformation depends to a significant extent on computing, communications, and connectivity technologies, as well as on the capacity of communications infrastructure to support digital services. (S.Silva, Marujo, & Senna, 2026, p. 02)

Accordingly, digital communications infrastructure can be viewed as the

foundation of digital transformation, while digital transformation represents the organizational, economic, and social outcome of using that foundation. Infrastructure provides connectivity, data, and platforms, whereas digital transformation employs these resources to reorganize services, improve their efficiency, and expand their use.

3. The Development of Fixed and Mobile Telephony Infrastructure in Algeria

Fixed and mobile telephony represent key components of Algeria's digital communications infrastructure, as they provide the connectivity foundation required for data transmission and the expanded use of digital services. They also reflect the readiness of individuals and institutions to integrate into the digital environment. From this perspective, the digital transformation process cannot be analyzed independently of the development of telephone networks in terms of subscription numbers, types of technology, penetration rates, and coverage quality.

4.1 The Development of the Fixed Telephone Network

Algeria's fixed telephone network experienced sustained growth from 2018 to the third quarter of 2025, with the number of subscriptions increasing from 4,164,039 in 2018 to 5,934,394 in the first half of 2023. (Ministry of Post and Telecommunications, 2023, p. 06) The number of fixed telephone subscriptions subsequently increased to 6,636,404 in the third quarter of 2024 and reached 7,501,156 in the third quarter of 2025. Accordingly, the subscriber base recorded an overall increase of 3,337,117

subscriptions compared with 2018, representing a growth rate of 80.14%. Total connection capacity also rose from 7,272,466 lines in 2018 to 9,766,561 lines in the first half of 2023, reflecting the network's expanded capacity to accommodate connection requests and serve a larger number of households and institutions. (Regulatory Authority for Post and Electronic Commu, 2025, p. 01)

The development of fixed telephony is also reflected in the changing technological structure of subscriptions. The network is no longer based solely on conventional wired lines, but now includes fixed 4G LTE, Fiber to the Home (FTTH), and specialized lines (LS). In the first quarter of 2023, the total number of fixed telephone subscribers reached 5,758,353, including 3,632,521 wired subscriptions, 1,493,117 fixed 4G LTE subscriptions, and 617,324 FTTH subscriptions. This distribution highlights a gradual shift from conventional connectivity toward technologies with a greater capacity to support high-speed Internet and digital applications. ((ARPCE), 2023, pp. 01-02) The fixed telephone penetration rate reached 13.04% at the end of March 2023, while the proportion of households with a fixed telephone line stood at 78.24%. The continued increase in the number of subscribers through 2025 is particularly significant, as it reflects the expansion of household and institutional access to telecommunications and Internet services, especially given the integration of fixed telephony with fiber-optic services and fixed wireless access. This development supports digital education, remote work, e-

government services, and electronic banking services. ((ARPCE), 2023, p. 02) Data from the Fixed Telephony Market Observatory indicate that the total subscriber base increased from 5,202,103 subscriptions in the first quarter of 2022 to 5,758,353 subscriptions in the first quarter of 2023, representing an annual growth rate of 10.69%. By contrast, total voice traffic declined from 340 million minutes to 254 million minutes over the same period. This trend reflects a shift in network use away from conventional voice communications toward applications increasingly associated with Internet access and data transmission. ((ARPCE), 2023, pp. 03-04)

This upward trend continued throughout 2024 and 2025, as the number of subscribers increased from 6,636,404 in the third quarter of 2024 to 6,931,444 in the fourth quarter of the same year. ((ARPCE) R. A., 2024, p. 03)

The number of subscribers then rose to 7,146,747 in the first quarter of 2025 and 7,375,688 in the second quarter, before reaching 7,501,156 in the third quarter. This represented an annual growth rate of 13.03% compared with the same period in 2024. This trend demonstrates that fixed telephony has become an increasingly important component of digital communications infrastructure, particularly with the growing reliance on FTTH and fixed 4G LTE technologies for providing Internet access and data transmission services. ((ARPCE) R. A., Fixed Telephony Market Observatory in Algeria, 2025, p. 01)

Table 1. Development of the Number of Fixed Telephone Subscribers in Algeria, 2018–2025.

Period	Fixed Telephone Subscribers
2018	4.164.039
2019	4.635.217
2020	4.785.763
2021	5.097.059
2022	5.576.193
First Half 2023	5.934.394
Third Quarter of 2024	6.636.404
Fourth Quarter of 2024	6.931.444
First Quarter of 2025	7.146.747
Second Quarter of 2025	7.375.688
Third Quarter of 2025	7.501.156

Source : ((ARPCE) R. C., 2023) ; ((ARPCE) R. A., Fixed Telephony Market Observatory in Algeria, 2024) ; ((ARPCE) R. A., Fixed Telephony Market Observatory in Algeria, 2025).

The table shows that the number of fixed telephone subscribers increased from 4,164,039 in 2018 to 7,501,156 in 2025. (Ministry of Post and Telecommunications, 2023, p. 03) in the third quarter of 2025, representing a total increase of 3,337,117 subscribers. ((ARPCE) R. A., Fixed Telephony Market Observatory in Algeria, 2025) This represents a growth rate of approximately 80.14% over the period, reflecting the expansion of fixed connectivity and the increasing reliance on FTTH and fixed 4G LTE technologies.

4.2 The Development of the Mobile Telephone Network

Mobile telephony in Algeria underwent a significant transformation following the opening of the telecommunications market to competition under Law No. 2000-03. This reform enabled new operators to enter the market and contributed to its development. It was followed by the

introduction of second-generation technology in 2001, third-generation technology in December 2013, and fourth-generation technology in September 2016. This process helped transform mobile telephony from a voice communication tool into a primary means of accessing the Internet and digital services. (Ministry of Post and Telecommunications, 2023, p. 03)

Data for the first half of 2023 indicate that Algeria's mobile telephone market reached 48,915,484 subscriptions, comprising 46,340,308 prepaid subscriptions and 2,575,176 postpaid subscriptions. Prepaid subscriptions therefore accounted for 94.74% of the total. This pattern reflects the broad individual use of mobile telephony, as prepaid plans offer greater flexibility in accessing services, particularly for users who do not rely on fixed monthly subscriptions. (Ministry of Post and Telecommunications, 2023, p. 09)

In terms of operators, the market maintained its structure based on three main providers. Mobilis recorded 21,252,647 subscriptions in the first half of 2023, compared with 15,272,197 subscriptions for Djezzy and 12,390,640 for Ooredoo. These figures indicate that competition among operators remained an important factor in expanding service offerings and improving the geographical and technological coverage of mobile telephony services. (Ministry of Post and Telecommunications, 2023, p. 10)

In technological terms, the data reveal a clear shift from older generations toward 4G. The number of 4G subscriptions reached approximately 39,679,729 in the first half of 2023, compared with 5,464,880 3G subscriptions and 3,770,875 GSM

subscriptions. Compared with 2022, 4G subscriptions increased by 2.27%, whereas GSM and 3G subscriptions declined by 11.49% and 8.33%, respectively. This confirms that the development of mobile telephony has become not only quantitative but also technological, as users increasingly migrate toward networks with greater data transmission capacity. (Ministry of Post and Telecommunications, 2023, pp. 11-12)

Coverage indicators further support this transformation. GSM and 3G networks cover almost the entire population, while 4G coverage exceeded 85% of the population by the end of 2022. Mobile telephone penetration reached 105.07% in the first half of 2023 and has remained relatively stable since 2017 due to market saturation. This indicates that the main challenge is no longer limited to increasing subscriber numbers, but now involves improving service quality, increasing data transmission speeds, and expanding data-based uses. (Ministry of Post and Telecommunications, 2023, p. 13)

Turning to 2024 and 2025, the mobile telephony market continued to expand, with the number of subscribers increasing from 53,454,905 in the third quarter of 2024 to 55,941,086 in the third quarter of 2025, representing an annual growth rate of 4.65%. This confirms that mobile telephony remains the most widely used channel for accessing telecommunications and Internet services in Algeria. ((ARPC) R. A., Fixed Telephony Market Observatory in Algeria, 2025, p. 01)

Table 2. Development of the Number of Mobile Telephone Subscribers in Algeria, 2018–2025

Period	Mobile Telephone Subscribers
2018	47.154.264
2019	45.425.533
2020	45.555.673
2021	47.015.757
2022	49.018.766
First Half 2023	48.915.484
Third Quarter of 2024	53.454.905
Fourth Quarter of 2024	54.050.526
First Quarter of 2025	54.266.593
Second Quarter of 2025	54.874.360
Third Quarter of 2025	55.941.086

Source : (Ministry of Post and Telecommunications, 2023, p. 09) ; ((ARPCE) R. A., Fixed Telephony Market Observatory in Algeria, 2025)

The table shows that the number of mobile telephone subscribers increased from 47,154,264 in 2018 to 55,941,086 in the third quarter of 2025, representing an increase of 8,786,822 subscribers and an overall growth rate of approximately 18.63%. The indicator declined in 2019 and 2020 before following an upward trend from 2021 onward, reflecting the continued expansion of the mobile user base and the growing role of mobile telephony in facilitating access to the Internet and digital services. (Regulatory Authority for Post and Electronic Commu, 2025, p. 01)

4.3 The Extension of Fixed and Mobile Telephony Development to the Internet Subscriber Base

An analysis of the development of fixed and mobile telephony infrastructure remains incomplete without linking it to Internet indicators, as digital transformation depends on the capacity of fixed and mobile networks to transmit data and support digital services. In this context,

the total number of fixed and mobile Internet subscribers increased from 56.54 million in the third quarter of 2024 to 60.54 million in the third quarter of 2025, representing a growth rate of 7.07%. This increase reflects the expansion of digital access and the growing potential for the use of electronic services. ((ARPCE) R. A., Fixed Telephony Market Observatory in Algeria, 2025, p. 01)

Table 3. Development of the Number of Fixed and Mobile Internet Subscribers in Algeria, 2018–Third Quarter of 2025

Period	Fixed and Mobile Internet Subscribers (Millions)
2018	39.41
2019	40.49
2020	42.56
2021	45.96
2022	49.46
First Half 2023	50.24
Third Quarter of 2024	56.54
Fourth Quarter of 2024	57.54
First Quarter of 2025	58.14
Second Quarter of 2025	59.10
Third Quarter of 2025	60.54

Source : (Ministry of Post and Telecommunications, 2023, p. 09) ; ((ARPCE) R. A., Fixed Telephony Market Observatory in Algeria, 2025)

The table shows that the number of subscribers increased from 39.41 million in 2018 to 60.54 million in the third quarter of 2025, representing an increase of 21.13 million subscribers and a growth rate of 53.62%. This trend reflects the expansion of Internet access and the increasing reliance of individuals and institutions on fixed and mobile networks to use digital services.

4.4 The Significance of Fixed and Mobile Telephony Development in Supporting Digital Transformation

The development of fixed and mobile telephony indicates that Algeria's digital communications infrastructure has moved from a phase focused on expanding quantitative access to one characterized by technological transformation. In fixed telephony, this shift is reflected in the expansion of FTTH and fixed 4G LTE, while in mobile telephony it is demonstrated by the dominance of 4G, the declining reliance on GSM and 3G, and the continued growth of the total mobile subscriber base through 2025.

This development also shows that mobile telephony has become the most widely used channel for accessing digital services, particularly with the increase in subscriber numbers and the expansion of network coverage. Fixed telephony, meanwhile, continues to play an important role in connecting households and institutions, especially when combined with fixed Internet and fiber-optic services.

Accordingly, the development of fixed and mobile telephony infrastructure has contributed to supporting digital transformation in Algeria through three main pathways: expanding access to telecommunications and Internet services, shifting toward technologies with greater data transmission capacity, and improving the readiness of individuals and institutions to use digital applications. However, this progress still requires continued efforts to improve service quality, increase data transmission speeds, and ensure more balanced coverage across different regions.

4. The Development of Fixed and Mobile Internet Infrastructure in Algeria

Fixed and mobile Internet constitute the components most closely associated with digital transformation, as various digital services, including e-government, digital education, e-commerce, electronic payments, and banking services, require networks capable of transmitting data rapidly and reliably. Therefore, the growth of Internet subscriptions reflects not only broader access to the service but also the expansion of the technical foundation underpinning digital transformation in Algeria.

4.1 The Development of Fixed Internet Infrastructure

Algeria's fixed Internet network experienced significant growth between 2018 and 2023, with the number of subscriptions increasing from 3,063,100 in 2018 to 5,095,712 in the first half of 2023. This growth was driven by the expansion of ADSL, fixed 4G LTE, and Fiber to the Home (FTTH) technologies, which enhanced the network's capacity to provide households and institutions with more stable digital services. (Ministry of Post and Telecommunications, 2023, p. 15)

The qualitative transformation of fixed Internet is reflected in the expansion of fiber-optic technology. FTTH subscriptions increased from 11,369 in 2018 to 740,109 in the first half of 2023. Fixed 4G LTE subscriptions also rose from 861,235 in 2018 to 1,571,912 in the first half of 2023. This trend demonstrates a gradual shift from conventional connectivity toward technologies with greater capacity to support high-speed data transmission and modern digital services.

(Ministry of Post and Telecommunications, 2023, p. 15)

Data on connection speeds also show that subscriptions exceeding 10 Mbps accounted for the vast majority of fixed Internet subscriptions. In the first half of 2023, subscriptions ranging from 10 Mbps to less than 20 Mbps represented 89.47% of the total, while subscriptions of 20 Mbps or more accounted for 10.32%. This reflects an improvement in the quality of Internet access, rather than merely an increase in the number of subscriptions. (Ministry of Post and Telecommunications, 2023, pp. 16-17)

4.2 The Development of Mobile Internet

Mobile Internet experienced greater expansion than fixed Internet due to the widespread use and flexibility of mobile telephony. The number of mobile Internet subscribers increased from 36,342,601 in 2018 to 45,144,609 in the first half of 2023. This growth was primarily driven by users' migration from 3G to 4G, which provides higher speeds and greater capacity for using digital applications. (Ministry of Post and Telecommunications, 2023, p. 17)

The data show that 4G mobile Internet subscriptions increased from 18,920,289 in 2018 to 39,679,729 in the first half of 2023. By contrast, 3G subscriptions declined from 17,422,312 to 5,464,880 over the same period. This confirms that the development of mobile Internet in Algeria was not merely quantitative, but also involved a technological shift toward networks with greater data transmission capacity. (Ministry of Post and Telecommunications, 2023, pp. 17-18)

Mobile Internet penetration reached 96.97% of the population in the first half of 2023. This rate highlights the importance

of mobile telephony as the most widely used channel for Internet access, particularly in areas where fixed Internet services remain less widespread or less reliable. (Ministry of Post and Telecommunications, 2023, p. 17)

4.3 The Development of the Total Fixed and Mobile Internet Subscriber Base Through 2025

The development of the total fixed and mobile Internet subscriber base shows a sustained upward trend through 2025. The number of subscribers increased from 39.41 million in 2018 to 50.24 million in the first half of 2023, then reached 56.54 million in the third quarter of 2024 and 60.54 million in the third quarter of 2025. This trend reflects the continued expansion of digital access in Algeria. ((ARPCE) R. A., Fixed Telephony Market Observatory in Algeria, 2025)

Table 4. Development of Fixed and Mobile Internet Subscribers in Algeria, 2018–Third Quarter of 2025

Period	Fixed and Mobile Internet Subscribers (Millions)
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2019	40.49
2020	42.56
2021	45.96
2022	49.46
First Half 2023	50.24
Third Quarter of 2024	56.54
Fourth Quarter of 2024	57.54
First Quarter of 2025	58.14
Second Quarter of 2025	59.10
Third Quarter of 2025	60.54

Source : ((ARPCE) R. C., 2023) ; ((ARPCE) R. A., Fixed Telephony Market Observatory in Algeria, 2024) ; ((ARPCE) R. A., Fixed Telephony Market Observatory in Algeria, 2025)

The table shows that the number of fixed and mobile Internet subscribers increased from 39.41 million in 2018 to 60.54 million in the third quarter of 2025, representing an increase of 21.13 million subscribers and an overall growth rate of approximately 53.62%. This indicates that the Internet has become the most dynamic component of the telecommunications sector and the one most closely associated with expanding the use of digital services in Algeria. ((ARPCE) R. A., Fixed Telephony Market Observatory in Algeria, 2025)

4.4 The Significance of Internet Development in Supporting Digital Transformation

The development of fixed and mobile Internet shows that Algeria has moved beyond merely expanding Internet access toward improving connection quality and increasing data use. The expansion of FTTH and fixed 4G LTE has enhanced household and institutional Internet services, while the widespread adoption of mobile Internet has extended digital access across a broad segment of the population.

The increase in the Internet subscriber base to more than 60 million in the third quarter of 2025 also demonstrates that the Internet is no longer merely a means of communication. It has become an essential foundation for delivering digital services, expanding e-government, developing distance education, promoting e-commerce, and supporting electronic payments and digital banking services.

Accordingly, the development of fixed and mobile Internet infrastructure has contributed to advancing digital transformation in Algeria through three

main pathways: expanding access to networks, improving data transmission capacity, and providing a technological environment conducive to the growth of digital services. Nevertheless, this process still requires continuous improvements in service quality, wider fiber-optic coverage, and further efforts to reduce the digital divide between regions.

5. The Contribution of Digital Communications Infrastructure to Supporting Digital Transformation in Algeria

Digital communications infrastructure constitutes a fundamental basis for digital transformation, as the digitalization of services and processes cannot be achieved merely by converting documents and procedures into digital formats. It requires communications networks capable of ensuring access, enabling data transmission, maintaining service continuity, and facilitating the interaction of individuals and institutions with digital platforms. Therefore, the development of fixed and mobile telephony, as well as fixed and mobile Internet services in Algeria, represents a direct factor in creating the technological environment required for digital transformation.

5.1 Expanding Access to Digital Services

The expansion of telephone and Internet networks has broadened access to digital services. Previous data show that the number of fixed telephone subscribers reached 7,501,156 in the third quarter of 2025, while mobile telephone subscriptions rose to 55,941,086. During the same period, the combined number of fixed and mobile Internet subscribers reached 60.54 million. These indicators

reflect the widening base of digital connectivity within Algerian society, whether through household and institutional connections or mobile telephony. ((ARPCE) R. A., Fixed Telephony Market Observatory in Algeria, 2025)

The significance of this expansion lies in making digital services more accessible and usable. As access to telephone and Internet networks expands, so does the potential use of e-government services, distance education, electronic payments, e-commerce, and digital banking services. Communications networks therefore evolve from being merely technical infrastructure into an enabling tool that supports the transition of society and the economy toward digital modes of interaction.

5.2 Supporting the Digitalization of Public Administration and Services

Digital communications infrastructure supports the digitalization of public administration by providing the technical foundations required to connect administrative bodies, exchange data, deliver remote services, and reduce dependence on paper-based transactions. Digital public services cannot operate efficiently without stable communications networks, secure databases, and sufficient data transmission speeds to allow citizens and public administrations to use digital platforms simultaneously.

Algeria's National Digital Transformation Strategy 2025–2030 confirms this interdependence by identifying core information and communication technology infrastructure

as one of the foundational pillars of digital transformation and linking it to high-quality communications networks and data centers. The strategy also recognizes that achieving digital transformation requires high-quality digital connectivity for all, together with accessible and fully digitalized public services.

(Digitalization, 2024, pp. 03-13-14)

From this perspective, the expansion of fixed and mobile telephony and Internet services is not an end in itself, but a means of improving the efficiency of public administration, strengthening citizens' interaction with public services, accelerating transactions, and enhancing transparency. These benefits become particularly significant when communications networks are linked to unified digital platforms and interoperable databases across sectors. (Wirtz, 2022)

5.3 Promoting the Digital Economy and Expanding Electronic Transactions

The development of digital communications infrastructure plays an important role in supporting the digital economy, as economic and commercial institutions require reliable connectivity to use cloud services, digital marketing, e-commerce, electronic payments, customer relationship management systems, and communication tools for interacting with suppliers and business partners. As connection quality improves, institutions become better able to integrate digital solutions into their daily operations.

The importance of this role lies in the fact that digital transformation is not limited to the use of technology; rather, it involves changing processes, improving performance, and developing business

models. Recent literature indicates that digital transformation goes beyond simple automation to encompass a broader rethinking of the relationship among technology, people, processes, and organizational performance. (Elia, Solazzo, Lerro, Pigni, & L. Tucci, 2024, pp. 381-384) In Algeria, the expansion of Internet access and mobile telephony provides a favorable environment for the growth of digital services targeting both institutions and individuals. However, translating this expansion into a tangible economic impact requires the development of reliable payment platforms, the promotion of e-commerce, stronger cybersecurity, and the widespread development of digital skills within institutions.

5.4 Improving the Readiness of Individuals and Institutions for Digital Transformation

The contribution of communications infrastructure is not limited to the technical dimension; it also extends to improving the readiness of individuals and institutions to use technology. Broad and reliable connectivity encourages individuals to become more accustomed to digital applications and motivates institutions to adopt new approaches to management, communication, and service delivery.

Contemporary studies confirm that digital readiness depends not only on the availability of technology, but also on access to infrastructure, digital literacy, skills development, and the ability to participate effectively in the digital work environment. Limited access or inadequate digital skills may therefore turn digital transformation into a source of exclusion

rather than a means of inclusion. (S.Silva, Marujo, & Senna, 2026, p. 106)

Therefore, the expansion of digital communications infrastructure in Algeria represents a necessary step, but it is not sufficient on its own to ensure comprehensive digital transformation. It must be accompanied by continuous employee training, simplified digital services, improved user experience, and stronger trust in electronic transactions.

5.5 Reducing the Digital Divide and Promoting Digital Inclusion

The widespread use of mobile telephony and Internet services contributes to reducing the digital divide among individuals and regions, particularly because mobile telephony represents the most widely used channel for Internet access in Algeria. However, this expansion does not eliminate challenges related to disparities in service quality, differences in data transmission speeds, and uneven coverage between urban and rural areas. This highlights the need to move beyond measuring subscriber numbers alone and to assess connection quality, data transmission speed, service stability, the ability to use digital services, and user satisfaction. Genuine digital transformation is not achieved merely by providing connectivity, but when that connectivity enables citizens and institutions to access and use digital services easily and effectively.

5.6 Supporting Digital Sovereignty and Cybersecurity

The development of digital communications infrastructure contributes to strengthening digital sovereignty through the expansion of national networks, data centers, and cloud

services. These components enhance the state's ability to manage its data and digital services securely while reducing dependence on external solutions when supported by appropriate national protection and regulatory policies.

Algeria's National Digital Transformation Strategy identifies digital security and the legal and regulatory framework as key foundations supporting digital transformation. This highlights that communications infrastructure should not develop independently of data and system protection, as the expansion of digital services simultaneously increases the need for cybersecurity and effective data governance. (Digitalization, 2024, pp. 03-20)

It can be concluded that digital communications infrastructure has supported digital transformation in Algeria by providing a broad technical foundation for connectivity, expanding Internet access, and enabling public administrations, institutions, and individuals to use digital services. It has also facilitated the transition from traditional communication systems toward data transmission, digital services, and platform-based models.

However, the impact of this infrastructure remains dependent on several complementary conditions, most notably improving service quality, expanding fiber-optic coverage, increasing data transmission speeds, reducing the digital divide between regions, developing digital skills, and strengthening cybersecurity. Digital communications infrastructure therefore constitutes a necessary condition for digital transformation, but it generates economic and social value only when integrated with digital governance, human capital, the

digital economy, and trust in electronic services.

6. Conclusion

This study sought to analyze the development of digital communications infrastructure in Algeria and its role in supporting the digital transformation process by tracking indicators related to fixed telephony, mobile telephony, fixed Internet, and mobile Internet from 2018 to the third quarter of 2025. These indicators were examined in relation to their economic, administrative, and social implications within the broader context of digital transformation.

The study demonstrated that digital communications infrastructure constitutes a fundamental prerequisite for successful digital transformation. The expansion of e-government, the development of digital education, and the promotion of e-commerce, electronic payments, and digital banking services cannot be achieved without communications networks capable of ensuring access, data transmission, service stability, and effective interaction between individuals, institutions, and digital platforms.

The findings also revealed that Algeria's telecommunications sector experienced both significant quantitative growth and a clear technological transformation in recent years. The number of fixed telephone subscribers increased from 4,164,039 in 2018 to 7,501,156 in the third quarter of 2025, representing a growth rate of approximately 80.14%. This increase reflects the expansion of fixed connectivity and the growing importance of FTTH and fixed 4G LTE technologies in supporting high-speed Internet access.

The study further found that mobile telephony remained the most widely used channel for accessing telecommunications and Internet services. The number of mobile subscribers rose from 47,154,264 in 2018 to 55,941,086 in the third quarter of 2025, representing an increase of approximately 18.63%. This confirms the central role of mobile telephony in expanding everyday digital use, particularly with the growth of 4G networks and the declining reliance on older generations of mobile technology.

With regard to Internet services, the total number of fixed and mobile Internet subscribers increased from 39.41 million in 2018 to 60.54 million in the third quarter of 2025. This represents an increase of 21.13 million subscribers and an overall growth rate of 53.62%. These figures indicate that the Internet has become the most dynamic component of Algeria's digital communications infrastructure and the one most closely associated with the expansion of digital service use.

One of the study's key findings is that the development of digital communications infrastructure in Algeria was not limited to quantitative expansion. It also involved a significant technological shift through the wider deployment of fiber-optic networks, the spread of fixed 4G LTE, and the dominance of 4G in mobile Internet services. This reflects the transition of the telecommunications sector from a model centered on traditional connectivity toward one focused on data transmission and the operation of modern digital services.

The study also showed that digital communications infrastructure supports digital transformation through several major pathways. These include expanding access

to digital services, supporting the digitalization of public administration, promoting the digital economy, enabling distance education and training, supporting digital health services, and providing the technical foundation required for the use of modern technologies such as the Internet of Things, digital platforms, and cloud computing.

Accordingly, the findings support the main hypothesis that the development of digital communications infrastructure in Algeria contributes to advancing the digital transformation process by expanding access to telecommunications and Internet services and improving the readiness of individuals and institutions to use digital applications. However, this contribution remains dependent on service quality, network stability, equitable coverage across regions, the availability of digital skills, and stronger cybersecurity.

In this context, the study emphasizes that the next challenge is not limited to increasing subscriber numbers or expanding network coverage. Rather, it lies in moving from a quantitative approach toward one based on quality and value. This requires improving data transmission speeds, expanding fiber-optic coverage, reducing the digital divide, supporting data centers, developing effective digital services, and training human resources capable of using this infrastructure efficiently.

In conclusion, digital communications infrastructure in Algeria represents a major driver of digital transformation, but it is not sufficient on its own to achieve a comprehensive digital transition. Its economic and social impact can only be fully realized when it is integrated with effective

digital governance, digitalized public services, a productive digital economy, qualified human capital, and a legal and security environment that strengthens trust in digital transactions.

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