

The reality of digital transformation in Algerian economic institutions: a case study of Algeria Telecom in Chlef Province

La réalité de la transformation numérique dans les institutions économiques algériennes: étude de cas d'Algérie Télécom dans la wilaya de Chlef

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Abstract:

This study aims to identify the reality of digital transformation practices and their operational impact at Algeria Telecom in Chlef. It employs a descriptive and analytical case study, examining the key theoretical foundations of digital transformation and its practical applications within the company. The study concludes that Algeria Telecom utilizes a diverse range of digital systems and technologies to enhance its administrative, technical, and commercial processes. This enables the company to minimize errors, reduce costs, improve service quality, and better respond to customer needs. Furthermore, the company has implemented a digital platform for handling complaints since the beginning of 2020, allowing customers to submit their opinions and complaints electronically and benefit from a feedback mechanism regarding services. Based on these findings, a set of recommendations relevant to the study's objectives is presented.

Keywords: digital transformation, digital systems, digital services, Algeria Telecom Corporation, Chlef.

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Résumé:

Cette étude vise à identifier la réalité des pratiques de transformation numérique et leur impact opérationnel au sein d'Algérie Télécom dans la wilaya de Chlef. Elle adopte une étude de cas descriptive et analytique, en examinant les principaux fondements théoriques de la transformation numérique ainsi que ses applications pratiques au sein de l'entreprise. L'étude conclut qu'Algérie Télécom utilise une gamme diversifiée de systèmes et de technologies numériques pour améliorer ses processus administratifs, techniques et commerciaux. Cela permet à l'entreprise de minimiser les erreurs, de réduire les coûts, d'améliorer la qualité des services et de mieux répondre aux besoins des clients. En outre, l'entreprise a mis en place, depuis le début de l'année 2020, une plateforme numérique de gestion des réclamations, permettant aux clients de soumettre électroniquement leurs avis et réclamations et de bénéficier d'un mécanisme de retour d'information concernant les services. Sur la base de ces résultats, un ensemble de recommandations en adéquation avec les objectifs de l'étude est formulé.

Mots-clés: transformation numérique, systèmes numériques, services numériques, Algérie Télécom, Chlef.

1. Introduction

The contemporary business environment is characterized by rapid transformation and change driven by continuous advances in digital technologies, including telecommunications networks and modern technological applications. These technologies have become key tools in the information and knowledge age and a strategic driver for organizations because they make it possible to improve and modernize services, adopt advanced systems, and strengthen competitiveness, thereby supporting business continuity in a dynamic and constantly changing environment.

The acceleration of these transformations has intensified competition and created new challenges for organizations. They are therefore required to continuously seek competitive advantage and excellence in the provision of products and services. With increasing innovation and technological change, organizational performance alone is no longer sufficient to maintain a competitive position. Organizations must continually improve their performance and strengthen their flexibility and ability to adapt in order to achieve the desired results and enhance their competitiveness in the market.

Despite the noticeable expansion in the adoption of digital systems and services within Algeria Telecom, it remains necessary to determine the extent to which this adoption has moved beyond the mere digitization of operations and services toward an integrated institutional digital transformation, and to examine how it is reflected in the efficiency of internal processes and customer experience. Accordingly, the problem of the study consists in diagnosing the reality of digital transformation practices at the Operational Directorate of Algeria Telecom in Chlef, identifying their main operational and service manifestations, and examining the indicators and challenges associated with them.

The main research question is therefore: What is the reality of digital transformation practices and their operational impacts at the Operational Directorate of Algeria Telecom in Chlef?

To answer this question, the following subquestions are posed:

1. What are the main dimensions and practices of digital transformation adopted at the Operational Directorate of Algeria Telecom in Chlef?
2. How have digital systems contributed to the development of administrative, technical, and commercial processes within the company?

3. What is the reality of customer-oriented digital services, and what do the available operational indicators reveal about their use?
4. What are the main challenges and gaps limiting the deepening of digital transformation within the company?

Objectives of the Study:

1. To identify the digital transformation practices adopted by the company under study.
2. To highlight the main digital systems and explain how they contribute to the development of the company's administrative processes.
3. To shed light on customer-oriented digital services.
4. To propose recommendations related to the subject of the study and draw the attention of managers of Algerian economic institutions to the requirements of digital transformation.

Research Method:

To address the research problem, the study adopts a descriptive and analytical case-study approach, in view of the nature of the topic, namely the reality of digital transformation practices at the Operational Directorate of Algeria Telecom in Chlef. The study relies on the data available for the period from 2020 to 2025.

2. Theoretical Framework

2.1. Digital Transformation

2.1.1. Definition of Digital Transformation

Digital transformation is a debated concept among writers and researchers because of the diversity of definitions and differences in interpretation. The principal definitions used in this study are as follows:

- a. Deloitte defines digital transformation as a process that improves the operational dimension through the use of technology to enhance organizational performance and fundamentally upgrade business activities that have been digitally transformed. Digital technologies can improve processes, talent interaction, and new business models (Zamoura & Ben Aissa, 2022, p. 309).
- b. IDC considers digital transformation a strategic choice for organizations because it enables continuous adaptation to customer and market requirements through the deployment of digital capabilities. It supports the creation of new business models, products, and services that combine digital and manual activities while simultaneously improving customer experience, operational efficiency, and organizational performance (Salaimi & Bouchi, 2019, p. 948).
- c. Herbert emphasizes that organizations should understand digital transformation not as a simple extension of existing activities, but as a business project led by top management and embraced by everyone because all services will be affected (Adnani & Hamou, 2020, p. 145).

On the basis of the foregoing definitions, digital transformation may be understood as a strategic orientation through which organizations deploy digital technologies to develop their processes, services, and business models, thereby improving operational efficiency, responding to environmental changes and customer needs, and strengthening their capacity for innovation and adaptation.

2.1.2. Importance of Digital Transformation

Digital transformation is a fundamental element in the development of economic institutions. It contributes significantly to improving administrative and operational performance and enables organizations to manage information and knowledge more efficiently. Its importance can be summarized as follows:

- a. Broad and in-depth access to information and its different sources and components.
- b. Reduction in the costs of obtaining information (Fliashi, 2022, p. 139).
- c. Facilitation of managerial supervision and monitoring of work processes.
- d. Assistance to commercial companies in expanding and acquiring a larger customer base.
- e. Improvement and organization of operational efficiency (Wahba & Qara, 2022, p. 3).
- f. Contribution to the creation and maintenance of digital communications infrastructure and to its management in ways that strengthen digital-data protection and transparency.
- g. Enhancement of institutional competitiveness and achievement of a stronger competitive position through the use of contemporary technologies and improved capacity for forecasting and future planning (Al-Ashwal, 2023, p. 9).

2.1.3. Objectives of Digital Transformation

By adopting digital transformation as a strategic option, organizations seek to achieve a number of objectives (Radwan & Al-Badri, 2023, p. 287):

- a. Enhancing creative thinking: through the application of new and innovative business models and the improvement of organizational frameworks and technical standards. This requires disseminating a more creative and collaborative culture throughout the industry and the organization in order to increase income generation and productivity and add value to the economy.
- b. Influencing productivity: investment in information and communication technologies can have a tangible positive effect on productivity growth by improving the efficiency with which factors of production are used, supporting organizational innovation capabilities, improving product design, and encouraging modern approaches to business management.
- c. Increasing economic growth: digital transformation can contribute to economic growth through increased investment in digital equipment, information and communication technologies, and computer software—commonly described as capital deepening—and through the restructuring of existing value chains, creation of new sources of value, and application of innovative business models that increase efficiency and sustainability (Qarin, 2022, p. 309).

2.1.4. Requirements for Digital Transformation

Implementing digital transformation requires a set of interrelated requirements involving technologies, data, human resources, processes, top-management support, and organizational culture:

- a. Top-management support: senior management is the foundation of every initiative or decision undertaken by an organization because it is the center of strategic decision-making. It has the authority to approve or reject initiatives and therefore plays a leadership role in adopting, supporting, and monitoring digital transformation. Digital transformation must become part of the organization's mission and current and future implementation strategy and must be reflected comprehensively and clearly in its objectives (Hassan & Khamis, 2022, p. 39).
- b. Organizational and digital culture: organizational culture consists of shared principles, values, and concepts among organizational leaders and long-serving employees, which are transmitted and taught to new members. It includes prevailing values that contribute to integration and coordination among different parts of the organization (Shadid, 2021, p. 204). Such culture should be flexible, strong, and adaptive so as to reduce resistance to change by promoting a culture of technology and Internet use; this requires changing and managing culture as a competitive advantage (Zabi & Baitish, 2021, p. 154).
- c. Technologies: digital transformation is built on an integrated system comprising operating systems, storage media, and software functioning within technological environments and data centers that allow organizational assets to be used continuously and efficiently. It also requires an appropriate level of service for employees, customers, and suppliers through professional teams responsible for

managing the technological system and network infrastructure, whether local or cloud-based (Boutoura & Al-Wafi, 2022, p. 522).

d. Data: organizations should manage and analyze data regularly and effectively to ensure accurate and reliable information and procedures, using appropriate tools for statistical analysis, data exploration, and forecasting (Yasser, 2019, p. 214). Data must also be monitored continuously to ensure uninterrupted flow and utilization in line with organizational objectives and expectations (Radouah, 2022, p. 142).

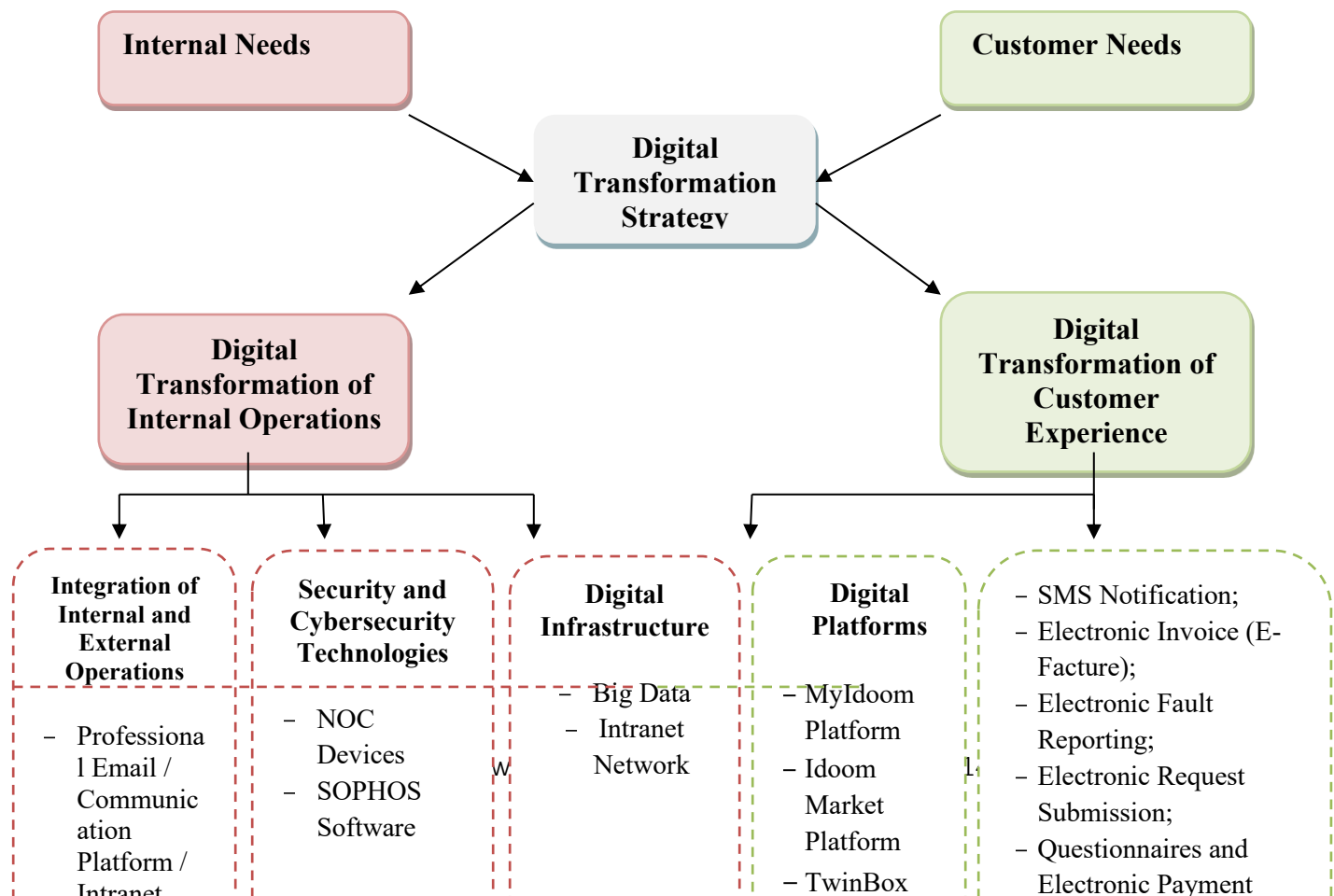
e. Human resources: the human element is a fundamental dimension in the success of any system, program, or organization. It is a key requirement for digital transformation through qualified and trained personnel capable of using digital technologies and analyzing data to make effective decisions. Planning and implementing digital visions also requires human competencies, scientific and practical expertise, and a commitment to change and development (Khalil & Gad, 2023, p. 4).

f. Processes: establishing effective technological infrastructure requires the development of internal and external organizational performance to ensure optimal digital transformation. This involves policies and procedures covering all interconnected organizational activities and processes, together with modern technologies and processed data (Qarini, 2022, p. 475).

3. Reality of Digital Transformation Practices at the Operational Directorate of Algeria Telecom in Chlef

With the rapid development of the telecommunications sector, Algeria Telecom has adopted the acquisition of modern technologies as a strategic option to support and implement its digital transformation strategies. The company has sought to deploy ready-made technological solutions to modernize its infrastructure, improve service quality, and enhance the efficiency of internal operations. This orientation has enabled the company to build its own digital transformation strategy around the following elements.

Figure 1: Digital Transformation Strategy in Algérie Télécom - Chlef Unit



Source: Prepared by the researchers based on information provided by the Directorate.

3.1. Digital Infrastructure

Digital systems are an integral part of Algeria Telecom's digital transformation strategy. They play a central role in improving operational efficiency and delivering innovative services to customers. These systems are intended to strengthen organizational performance, facilitate access to information, and simplify daily interactions between employees and customers. The company has focused on strengthening and restructuring its infrastructure in accordance with digital-transformation requirements by maintaining a highly developed Intranet. This contributes to rapid information access between the General Directorate and the various operational directorates, which in turn supports faster decision-making.

The star network architecture used by Algeria Telecom connects each computer to the directorate's central switch, and the same design is applied to the other organizational units. The company has also worked on managing big data through advanced data centers, which constitute the basic infrastructure for processing large volumes of data. Data Center software is used principally to organize and operate resources and infrastructure efficiently. Data centers contain servers, network devices, and storage equipment and are essential for processing, storing, and distributing BIG DATA within the organization.

Through these systems, Algeria Telecom can organize resources, monitor server status, and manage networks effectively. This improves data flow and protection through advanced security technologies and supports infrastructure management, including server management and continuous monitoring, network management to organize data flows across local networks or the Internet, and storage management to preserve data securely and efficiently. The systems also support process automation, such as data backup and system updates.

The software also provides tools for securing data and monitoring access through technologies such as encryption and firewalls, forming part of security management. In addition, data-center systems include energy and cooling management functions that monitor energy consumption and ensure effective equipment cooling, thereby improving operational efficiency. With these advanced systems,

Algeria Telecom can analyze large volumes of data and use the results to improve services and meet customer needs more efficiently.

3.2. Safety and Cybersecurity Technologies

Given the nature of the company's activities and the services it provides to natural and legal persons, together with the exchange of information and data associated with these services, the company must take appropriate measures to protect such information from hacking, damage, and unlawful use. Algeria Telecom has therefore adopted a set of technologies and tools for this purpose.

The company relies on smart monitoring technologies, particularly the Network Operations Center (NOC), which is used to manage and continuously monitor networks and technical systems. It is a core component for maintaining network performance and reliability. At the company, it supports continuous monitoring and management, helps detect and anticipate incidents, failures, and problems that could affect network performance, and alerts responsible personnel so that problems can be addressed before they adversely affect daily operations.

The company also uses surveillance cameras as part of its security system. These cameras contribute to monitoring the surrounding environment and ensuring safety, and the study reports the use of artificial-intelligence techniques to analyze images and identify suspicious activities. Smart sensing systems also include fire-detection devices using thermal and chemical sensors to detect abnormal increases in temperature or the presence of smoke and thereby support rapid emergency response.

Algeria Telecom also uses SOPHOS to protect its data and networks against viruses, malware, and other cyberattacks. It provides an additional security layer for the digital infrastructure, including servers, personal devices, and networks. Its main functions include:

- a. Protection against viruses and malware: SOPHOS detects and blocks malicious software before it affects systems.
- b. Network-level security management: the software provides tools for managing network security, monitoring suspicious activity, and preventing attacks.
- c. Malware protection: SOPHOS provides protection against malicious software that may target systems and result in data leakage or damage.

3.3. Digital Platforms

Digital platforms are among the most important solutions adopted by Algeria Telecom in its move toward digital transformation. They have contributed to developing service-delivery methods and strengthening interaction with customers by making a range of services available remotely. This reduces the need to visit agencies and accelerates the completion of different operations. The company has therefore adopted several digital platforms covering service management, e-commerce, integrated digital solutions, and customer communication.

My Idoom is one of the principal platforms. It allows customers to manage their services easily and efficiently, monitor data consumption and balances continuously, and pay bills electronically without visiting company offices. It also provides access to technical support, communication concerning inquiries, and information about available offers and new services. In this way, it facilitates customer interaction with the company and transforms several traditional operations into remotely accessible digital services.

Algeria Telecom also relies on Idoom Market as a digital e-commerce space through which users can purchase technological products and digital services online, including telephones, computers, accessories, and certain digital services and training products. The platform provides a simplified

interface in Arabic and French, supports electronic payment and delivery, and can be accessed through the website or mobile application. It also provides access to certain online educational services, particularly in cloud computing and cybersecurity, reflecting the expansion of digital solutions in the company's commercial and service activities.

The company has also developed, in cooperation with Djezzy, an integrated digital solution known as TwinBox. It combines Internet connectivity, entertainment broadcasting, and improved wireless coverage in a single solution. The solution consists of an Android 12 TV Box supporting various applications and digital services, a 4G router using a SIM card, and a Wi-Fi repeater based on Wi-Fi 5 technology that extends wireless coverage within the home. This integration provides a unified digital experience combining Internet access, entertainment content, and improved coverage quality.

Algeria Telecom also uses social-media networks as digital channels for direct customer communication and for disseminating information about services, offers, and developments. The company uses platforms including Facebook, X/Twitter, Instagram, and YouTube. These networks allow the company to publish news, updates, and promotional offers, respond to customer inquiries, and interact with users. Visual content, including photographs and videos, is also used to introduce services and provide explanations. Social media have therefore become an extension of the company's digital interface, offering rapid information dissemination and stronger customer interaction.

3.4. Integration of Internal and External Processes

The company relies on a set of internal digital communication tools designed to strengthen coordination among different departments and ensure that processes run efficiently and smoothly within the organizational structure. These tools improve information exchange, accelerate decision-making, and support integration between the company's commercial and technical activities.

3.4.1. Technologies Supporting Internal Processes

Digital technologies are fundamental to the development of Algeria Telecom's internal processes and to improving the management efficiency of its activities. The company uses a range of systems, platforms, and software that accelerate information flows, reduce reliance on paper transactions, and improve the speed and accuracy of administrative, technical, and financial tasks. These technologies also standardize information and make it available to the relevant departments at the appropriate time, supporting monitoring and control and helping managers make appropriate decisions.

a. Professional e-mail: Professional e-mail is a primary internal communication tool. Many operations and tasks are carried out through it, and employees can request documents without physically visiting the relevant department, such as salary statements and leave requests. Each employee has a professional e-mail in the form NameLastname@AT.DZ. Detailed monthly salary statements are sent through this channel, as are updated laws and regulations. Periodic meetings are organized by e-mail through links to remote-conferencing systems. The professional e-mail has consequently contributed substantially to reducing paper-based transactions. It also provides employees with information published in daily newspapers concerning the company, whether positive or negative, helping employees remain informed about the company's situation and supporting continuous performance improvement.

b. Communication Platform: This is an internal digital platform designed to strengthen interaction among Algeria Telecom employees and facilitate administrative operations. It provides an integrated work environment in which employees can manage administrative requests, consult official documents, follow internal developments, and communicate directly with departments. This improves performance efficiency, accelerates procedures, and reduces reliance on paper transactions.

Table 1: Services of the “Communication” Platform and Their Administrative and Organizational Objectives

Administrative service/process	French term	Organizational objective
Employment certificate	Attestation de travail	Proof of the employment relationship containing essential employee information and used for external procedures such as bank loans.
Exit authorization	Bon de sortie	Authorization to leave the workplace during official working hours for justified professional or personal reasons, with approval by the competent authority.
Employee badge	Badge Employé	Identification and access card containing employee information and photograph, used for entry and electronic attendance monitoring.
Mission order	Ordre de mission	Official assignment to perform a task outside the workplace, specifying duration, location, and purpose and providing entitlement to applicable allowances.
Employee leave	Congé employé	Request for a period of leave (annual, sick, or personal), assessed and approved according to the available leave balance.
Senior-management leave	Congé cadre supérieur	Administrative procedure for senior executives subject to careful review to ensure continuity of administrative operations.
RC request	Demande RC	Request for specific professional documents, such as an employment contract or salary certificate, to confirm employment status.
Fuel receipt/declaration	Décharge carburant	Document used to record and monitor fuel consumption allocated to company vehicles and promote rational use.
Employee transfer	Mutation	Procedure for transferring an employee between departments or positions, either at the employee's request or according to organizational needs.
Exploitation request	Demande d'Exploitation	Authorization to use company equipment and resources, such as devices and rooms, for work-related tasks.
Vehicle request	Demande de véhicule	Formal request to use a company coordination vehicle for travel between branches or visits to business partners.
Transport service	Transport	Company transport service facilitating employee travel to workplaces or external assignments.

Source: Prepared by the researchers based on information provided by the Human Resources Department.

a. Human-resources management software: HR Access, currently used in its ninth version (the third version was previously used), is a human-resources and payroll management package. It allows access to employee information from operational directorates and the General Directorate and has facilitated the work of the Human Resources Department.

b. Supply and accounting system (ORACLE): ORACLE is an information system operating on the company's internal network and dedicated to financial information, procurement, inventory management, and fixed-asset management. It records and documents financial operations to provide a picture of the company's revenues and requirements and supports preparation of the annual budget.

3.4.2. External Digital Empowerment

DO PROJET system: This information system is used by the Commercial Sub-Directorate, Technical Sub-Directorate, and Support and Resources Directorate. It manages Algeria Telecom's projects from registration of the annual investment-project plan through project completion and commissioning.

3.4.3. Digital Integration and System Interconnection Technologies

a. NGBSS system: This system facilitates customer relationship operations and strengthens coordination between commercial and technical activities. It consists of two main components:

b. BSS system: A platform developed by an Algeria Telecom team in coordination with the Chinese company Huawei. It consolidates the billing data used by the company into a single unified platform.

c. OSS system: An Operations Support System providing a comprehensive view not only of the network but also of technical intervention requests received through Customer Relationship Management (CRM).

3.5. Digital Customer Services

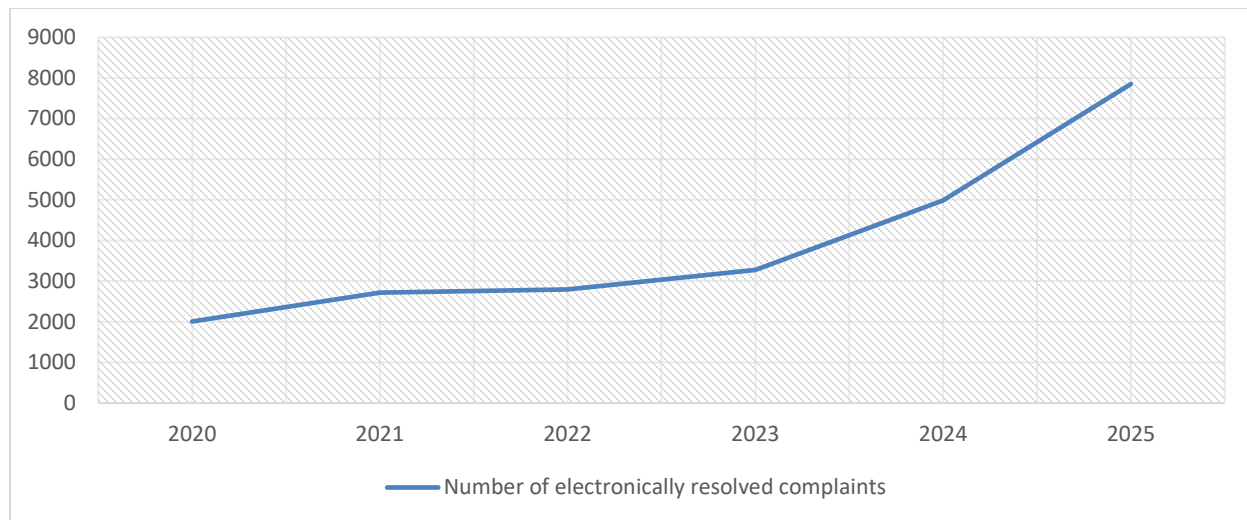
The company seeks to provide high-quality services to customers, which has encouraged it to introduce new digital services. It has launched a virtual agency to make services available 24 hours a day, seven days a week, in addition to electronic payment of telephone and Internet bills and subscriptions. The main services are as follows:

a. Telephone-bill notification by SMS: Algeria Telecom provides customers with a service that informs them of their telephone-bill amount and payment deadline. Customers subscribing to the service also receive information about new offers and promotions. The service is available free of charge through the customer's commercial agency (Algeria Telecom, 2026a).

b. Electronic invoice (E-Facture): This service allows customers to receive telephone bills by e-mail in addition to the conventional bill. Customers can then pay at the commercial agency or use electronic payment (Algeria Telecom, 2026b).

c. Reporting telephone or Internet faults: Customers can report technical problems or service interruptions electronically (Algeria Telecom, 2026c). Algeria Telecom has operated a digital complaints platform since the beginning of 2020, enabling customers to express opinions, submit grievances and complaints, seek compensation for damage, or recover material or non-material rights. The service has reportedly been well received by customers.

Figure 2: Evolution of the Number of Complaints Processed Electronically, 2020–2025

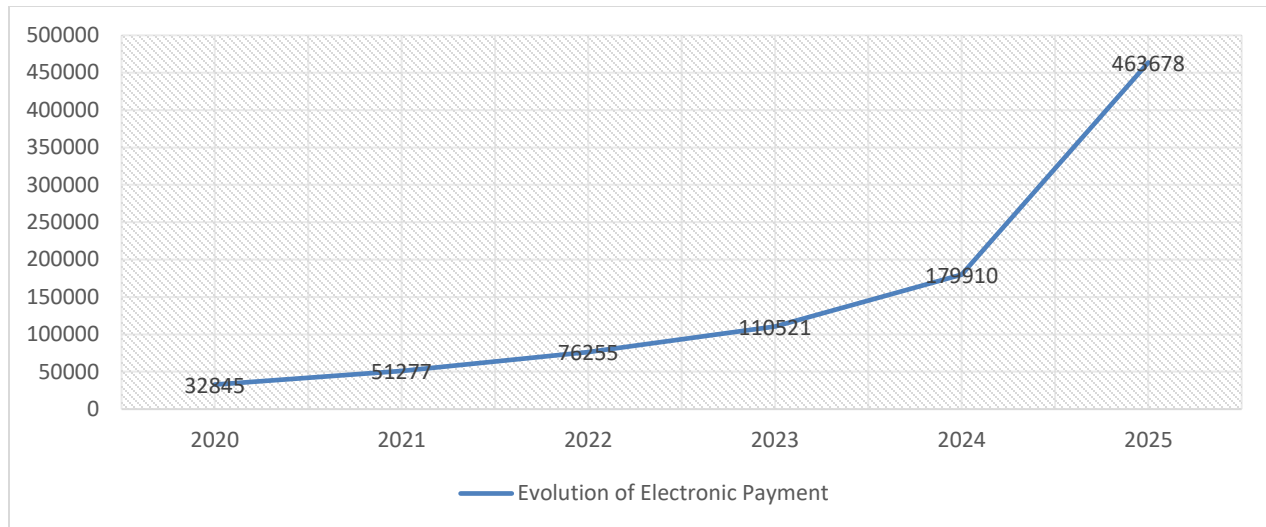


The company established a digital platform for handling complaints. **Source:** Prepared by the researchers based on Excel outputs. The number of electronically processed complaints increased continuously, reaching 7,850 in 2025. This pattern indicates the platform's capacity to receive complaints and respond to customers. According to the study, complaints are processed immediately or within a maximum of two days. This contrasts with earlier years, when the company faced significant pressure because of the volume of complaints and limited processing time, which generated customer dissatisfaction.

The electronic complaint-handling process consists of several stages. The customer submits a complaint through the platform, after which it is automatically routed through the BSS system to the commercial department for classification. Complaints concerning modem configuration or resetting, telephone or Internet-line faults, billing or payment problems, subscription or service-cancellation issues, continued billing after expiration, and opening a new customer account are handled by the commercial department. Other complaints are directed through the OSS system to the technical department, including repair of damaged fixed lines, repair of unstable customer equipment, requests to transfer telephone lines, Internet-connection problems, and recurring faults.

- Electronic requests: Algeria Telecom provides an electronic-request service through which customers can submit requests for specific services via the official website or designated applications, reducing the need to visit company offices.
- Electronic customer-satisfaction survey: Algeria Telecom provides a survey through which customers can comment on and evaluate telephone and Internet services. The survey is intended to collect opinions in order to improve service quality and maintain customer satisfaction (Algeria Telecom, 2026d).
- Electronic payment for fixed-line and Internet subscriptions: The company has adopted several digital methods for paying fixed-line telephone bills and Internet subscriptions. Customers can use BaridiMob on smartphones and Android tablets, Wimpay, launched by the company in partnership with Banque Nationale d'Algérie (BNA) in 2022, and Algeria Telecom's E-Paiement application, launched in 2019. Customers can also pay directly through the company's website using Algeria Post's Edahabia card or the CIB bank card. These channels facilitate payment, reduce the need to visit commercial agencies, and provide greater flexibility (Algeria Telecom, 2026e).

Figure 3: Evolution of Users' Payment Transactions, 2020–2025



Source: Prepared by the researchers based on Excel outputs.

In line with the company's digital-transformation policy, Algeria Telecom introduced electronic payment technology at the beginning of 2020, coinciding with the COVID-19 pandemic, as an alternative to visiting company offices to pay bills. This reduced the burden on customers and employees, helped limit infection risks, reduced costs, and supported business continuity. The number of users increased by more than 18,430 between 2020 and 2021 and continued to rise until 2025, when it reached 463,678 users. This development reflects the apparent effectiveness and customer acceptance of the technology because of its flexibility.

The descriptive data indicate that the company adopted this measure as a way to expand its customer base, provide immediate liquidity, and improve its corporate image. During 2023–2025, the company introduced several offers and incentives for customers using electronic payment. In 2023, discounts of up to 20% and Internet gifts ranging from 3 GB to 200 GB were offered. In 2025, the offers were structured as follows:

- a. Payment for one month: three free days.
- b. Payment for three months: 12 free days.
- c. Payment for six months: 24 free days.
- d. Payment for a full year: 48 free days.
- e. Data-protection service for computers, smartphones, and tablets: Kaspersky Total Security is offered through commercial agencies across 58 provinces and is presented as a protection solution against malware, viruses, and device intrusions (Algeria Telecom, 2026f).
- f. Professional e-mail service: Algeria Telecom provides Zimail, a professional e-mail service for work, study, and private projects. It combines e-mail with digital tools for organizing work and enhancing communication and collaboration. The service permits domain-name customization, is hosted in Algeria, and provides contacts, task calendars, document management, file storage and sharing, instant messaging, and document editing. It is compatible with LDAP/AD and the company's network and supports video conferencing compatible with Zoom. These functions create an integrated digital environment for communication, information management, document exchange, and collaborative work (Algeria Telecom, 2026g).
- g. Dorouscom e-learning platform: Algeria Telecom provides customers with the Dorouscom platform, allowing students to access online tutoring in different subjects in accordance with the curricula of primary, middle, and secondary education.

h. Cybersecurity training (online): Algeria Telecom offers SHIRUDO, an interactive cybersecurity training program based on the concept of serious games. It teaches safe practices and appropriate responses in an engaging manner, helping users avoid common cyberattacks and acquire appropriate responses. The program is designed for different levels and user profiles, including people without prior computer expertise, and provides a personalized and structured approach to strengthening digital culture and online confidence. Users can subscribe through Idoom Market or at a commercial agency.

The study also reports that the company is developing high- and very-high-speed broadband through modernization of its access network using next-generation FTTH (Fiber To The Home) technology. FTTH transmits data through optical fiber, using light signals through cables whose core is made of glass, allowing very high data-transfer speeds. Algeria Telecom has progressively replaced copper cables and connectors with optical-fiber infrastructure extending to homes and has marketed the service with a dedicated modem. Compared with ADSL over copper, the study identifies several advantages:

- a. Very high speeds, from 1 Mbps to 1 Gbps, with the highest speeds primarily intended for companies and institutions.
- b. Lower connection costs compared with copper in the relevant service context, together with lightness, ease of handling, and very high bandwidth that is less affected by distance.
- c. Greater resistance to environmental conditions and obstacles because of the physical characteristics of the fiber-optic infrastructure.

Table 2: Digital Services and Solutions Provided by Algeria Telecom

Digital service	Purpose	Electronic link
Telephone-bill notification by SMS	Notifies customers of bill amounts and payment deadlines and informs them of new offers, free of charge.	https://www.algeriatelecom.dz/ar/particuliers/notification-factures-telephoniques-par-sms-prod44
Electronic invoice (E-Facture)	Sends telephone bills by e-mail to facilitate digital payment.	https://www.algeriatelecom.dz/ar/particuliers/efacture-prod82
Fault reporting	Reports technical problems affecting telephone and Internet services and allows follow-up.	https://www.algeriatelecom.dz/ar/derangements
Electronic requests	Receives requests for new-line connections or subscription changes remotely.	https://www.algeriatelecom.dz/ar/demande-na
Customer-satisfaction survey	Evaluates field service performance and collects customer feedback.	https://www.algeriatelecom.dz/ar/page/sondage-satisfaction-client-p150
BaridiMob	Pays bills and Internet subscriptions through smartphones.	https://play.google.com/store/apps/details
Wimpay	Processes electronic payments in partnership with Banque Nationale d'Algérie.	https://play.google.com/store/apps/details
E-Paiement	Allows customers to top up and settle payments through the Algeria Telecom application.	https://play.google.com/store/apps/details

Company website payment gateway	Settles financial obligations using CIB and Edahabia cards.	https://paiement.algeriatelecom.dz/AR/index.php
Kaspersky protection	Protects users' devices against malware and viruses through a service available across 58 provinces.	https://www.algeriatelecom.dz/ar/produits/kaspersky-prod104
Professional e-mail (Zimail)	Manages institutional e-mail, supports local data hosting, and provides video-conferencing tools.	https://www.algeriatelecom.dz/ar/produits/zimail-prod103
Dorouscom	Provides school support and digital education for different educational levels.	https://dorouscom.com/
SHIRUDO cybersecurity course	Provides interactive training on prevention of cyber intrusions.	https://www.algeriatelecom.dz/ar/produits/shirudo-formation-en-cyber-securite-en-ligne-prod179

Source: Prepared by the researchers based on information provided by Algeria Telecom.

3.6. Challenges Facing Algeria Telecom in Implementing Its Digital Transformation Strategy

- High costs of acquiring and updating digital systems and technologies as a result of rapid developments in telecommunications and increasing requirements for modernization.
- Difficulty in securing specialized competencies and skills capable of operating modern systems and technologies and keeping pace with their development.
- Increasing cybersecurity and data-protection risks resulting from the expansion of digital systems, platforms, and services.
- Difficulty integrating the different digital systems in use, which may limit information exchange and coordination among departments.
- Resistance to change and the transition from traditional working methods to digital methods, which may slow the adoption of new technologies and systems.
- Difficulty keeping pace with rapid developments in digital infrastructure and networks, requiring continuous updating and development.
- Difficulty ensuring the continuity and quality of digital services as customers increasingly rely on digital channels and platforms.
- Difficulty keeping pace with changing customer needs and developing innovative digital services capable of maintaining the company's competitiveness in the telecommunications sector.

4. Conclusion

Digital transformation has become a central issue in organizational practice, particularly in light of the changes that digital technologies have introduced into the contemporary business environment. The rapid development of digital technologies and their expanding use have produced substantial changes in working methods, making digital-transformation strategies both a supportive option and an imperative for organizations, especially those operating in the telecommunications sector, which is vital to the national economy.

Findings:

- The study shows that digital transformation represents a strategic orientation for Algeria Telecom rather than merely a technical process involving the introduction of modern technologies.
- Digital transformation contributes to improved information and knowledge management by facilitating access to information and accelerating its circulation within the organization.

3. The adoption of digital technologies contributes to operational efficiency by accelerating procedures and reducing the time required for manual operations.
4. Digital systems improve information management and coordination among the different departments of Algeria Telecom.
5. Digital infrastructure, particularly the company's Intranet, contributes to faster access to information and supports decision-making.
6. Algeria Telecom relies on a diverse range of digital systems and technologies to develop its administrative, technical, and commercial processes.
7. The company is oriented toward developing customer-facing digital services through its virtual agency, electronic payment services, and services associated with bills and subscriptions.
8. Digital transformation contributes to improved service quality and a better response to customer needs by diversifying digital channels and services.
9. Digital systems contribute to reducing errors and costs and improving process management, particularly through automation and information flows between departments.
10. The company has operated a digital platform for processing complaints since the beginning of 2020, allowing customers to submit opinions, grievances, and complaints electronically and to benefit from a feedback mechanism concerning services.

Recommendations:

1. Continue developing digital infrastructure and internal networks to accelerate information flows and support decision-making.
2. Continue developing digital infrastructure and internal networks to accelerate information flows and support decision-making.
3. Expand the range of customer-oriented digital services and continue developing new services that respond to changing customer needs.
4. Promote the use of electronic payment and develop incentives and offers that encourage customers to rely on digital channels.
5. Invest in training and developing employees' digital skills so that they can continuously adapt to technological developments.
6. Establish a specialized internal team for software development and information security to strengthen protection of company data against increasing cyber risks.
7. Encourage digital innovation within the company by developing new digital services and solutions rather than merely digitizing traditional services.
8. Strengthen the culture of digital transformation and involve different administrative and functional levels in the process, given that digital transformation affects multiple services and operations.
9. Continue developing value-adding digital services, such as e-learning, video conferencing, and digital-protection services.

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