

Digital Transformation in Algerian Government Organizations: Current State and Challenges

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Abstract

The world is witnessing a rapid digital transformation, compelling government organizations to reevaluate their management methodologies and service delivery frameworks to align with the requirements of digital governance and sustainable development. In Algeria, digital transformation constitutes a strategic choice for modernizing public administration, improving service quality, and enhancing institutional performance efficiency. Nevertheless, realizing this transition encounters multifaceted organizational, human, and technical challenges that necessitate a comprehensive and integrated approach.

This paper aims to analyze the current reality of digital transformation within Algerian government organizations. It reviews the implementation mechanisms and the strategic pillars of this transformation, while highlighting the primary challenges impeding its execution. Methodologically, the study adopts a descriptive-analytical approach based on a comprehensive review of relevant scientific literature, reports, and prior studies.

The analytical findings indicate that Algerian government organizations have achieved notable progress in digitizing various administrative services and procedures. However, this advancement continues to face significant challenges, primarily resistance to change, budget constraints, inadequate training, and a weak organizational culture. The paper concludes that the success of digital transformation requires adopting an integrated strategic vision centered on human resource development, the dissemination of a digital culture, and the continuous improvement of infrastructure and legislative frameworks. This is essential to ensure the sustainability of digital transformation and elevate the overall performance of Algerian government organizations.

Keywords: Digital Transformation; Digitization; Government Organizations.

Introduction

In recent decades, the world has witnessed a radical transformation across various economic, social, and administrative domains as a result of the accelerating digital revolution driven by Information and Communication Technology (ICT), Artificial Intelligence (AI), cloud computing, the Internet of Things (IoT), and big data analytics. This evolution has led to the emergence of novel paradigms in organizational management. These paradigms transcend the mere utilization of electronic tools, extending to the redesign of administrative processes and the development of business models and

services fundamentally reliant on digital technologies—a phenomenon now recognized as Digital Transformation. Consequently, this transformation is no longer an optional organizational choice or a future orientation; rather, it has become a strategic imperative dictated by the changing global environment.

In this context, government organizations have emerged as one of the sectors in greatest need of adopting digital transformation, given their pivotal role in delivering public services and driving economic and social development. Modern public administration is no longer evaluated by the magnitude of its resources or the size of its workforce, but rather by its capacity to leverage digital technologies. This capability is essential for streamlining procedures, expediting transaction processing, enhancing service quality, promoting transparency, and combating bureaucracy and administrative corruption. Furthermore, it plays a critical role in supporting the decision-making process through reliance on accurate data and intelligent systems.

Statement of the Problem

Digital transformation has become one of the fundamental pillars of public administration reform across various countries worldwide, given its role in enhancing service quality, improving performance efficiency, promoting transparency, and streamlining administrative procedures. In recent years, Algeria has adopted a series of programs and strategies aimed at digitizing the public sector, striving to build a modern administration that meets citizens' expectations and the requirements of sustainable development.

However, the transition from traditional to digital administration is not merely a shift in technological tools; rather, it is a comprehensive organizational transformation. This shift necessitates a reevaluation of human resource competencies, budget allocations, organizational culture, and other related factors. Consequently, the success of this transformation is fundamentally contingent upon the organization's readiness for change management.

Accordingly, the primary research problem of this study is articulated through the following questions:

- How is digital transformation implemented within government organizations?
- What are the main challenges facing government organizations when implementing digital transformation?

Study Methodology:

The study adopted the descriptive-analytical approach due to its suitability for the nature and objectives of the research. This approach allows for describing the current state of digital transformation in Algerian governmental organizations and analyzing it in light of recent academic literature and relevant previous studies. The aim is to construct a comprehensive theoretical framework and identify the major challenges facing digital transformation.

1. The Concept of Digital Transformation:

Digital transformation refers to a set of radical changes in the culture of individuals and the type of technology employed within an organization, alongside the implementation of new operational models that lead to a shift in the organization's processes and strategic vision. It is essential to highlight the fundamental difference between digitization and digital transformation; meaning that digital

transformation is not merely the conversion of information from paper to digital formats. Rather, it encompasses the organization's entire infrastructure, its organizational culture, the methods of conducting business, and the alteration of business models. This is achieved through the utilization of all types of software applications, the Internet, mobile devices, and 3D printing within a virtual work environment, with the ultimate goal of reducing costs and improving the quality of product (Mostafa & Baghdadi, 2021, p. 114) or service delivery via the user experience.

2- Objectives of Digital Transformation:

- Digital transformation aims to enhance performance levels by facilitating the smooth and seamless transfer of information between departments and administrative units to support decision-making.
- Reducing costs and service delivery times by leveraging digital platforms that completely eliminate traditional paper-based processes.
- Optimizing the utilization of human capital by directing and focusing efforts on serving the customer or end-user.
- Fostering innovation and creativity within the organization to deliver high-quality products and services to customers.
- Improving operational efficiency.
- Achieving financial profitability and establishing new revenue streams.
- Providing remote services to customers to reduce physical queuing within organizations.
- Minimizing human errors in task execution.
- Adapting to the organization's external environment, which is characterized by complexity and rapid change in the era of digital transformation (Si Tayeb, 2024, p. 125).
- Safeguarding information from loss.
- Facilitating the process of information retrieval.
- Reducing effort, cost, and time.
- Achieving transparency in accessing information.
- Developing leadership styles and establishing new management models, such as remote management; promoting the adoption of virtual organizational structures; broadening the scope of decision-making authority; and mitigating the drawbacks of bureaucracy, which is typically characterized by lengthy and complex procedures.
- Aligning and adapting with international trends to enhance the competitive advantage of organizations.
- Mitigating administrative corruption by ensuring information availability on the Internet.
- The outcomes of digital transformation foster an interactive environment within the organization through the flexible and seamless communication, transfer, and exchange of information. This enables rapid information sharing and expansion, driven by digital networks that transmit massive volumes of data via highly intelligent routing technologies. This connectivity is classified as integrated because it allows for simultaneous transmission and storage. Furthermore, digital transformation is distinguished by its capacity to integrate multimedia—such as text and images—for simultaneous use, as well as publishing and archiving data for retrieval when needed (Abdel-Hamid, 2004, p. 45).

3. Principles of Digital Transformation

Successful digital transformation is predicated upon a set of foundational principles that guide organizations toward the effective utilization of technology and the realization of their future objectives. These principles facilitate a systematic and efficient approach to leveraging digital changes, whether through the adoption of emerging technologies, the reconceptualization of business models, or the development of the organizational and financial environment. These principles are elucidated below:

3.1. Use of Technology:

The use of technology addresses the organization's attitude toward new technologies, as well as its capacity to exploit them. Consequently, it encompasses the strategic role of Information and Communication Technology (ICT) within the organization and its future technological ambitions. Thus, the organization must determine whether it aims to be a pioneer in technology utilization—capable of establishing its own technological standards—or if it prefers to adopt pre-existing standards, viewing technology primarily as a facilitator for executing business operations.

3.2. Changes in Value Creation:

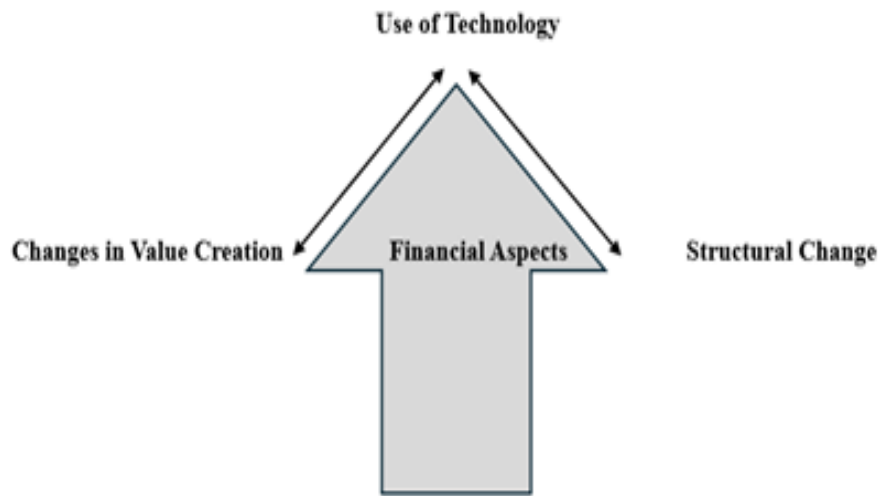
This dimension pertains to the impact of digital transformation strategies on organizational value chains; specifically, the extent to which new digital activities diverge from the core business, which often remains traditional. While further transformations offer opportunities to expand and enrich the existing portfolio of products and services, they are frequently accompanied by a heightened demand for technological competencies and greater risks stemming from a lack of experience in these novel domains. The digitization of products or services may necessitate alternative monetization mechanisms, or even structural adjustments to the organization's overall business scope.

3.3. Structural Change:

As various technologies are employed to create value, structural changes are frequently required to establish an adequate foundation for the transformation of organizational operations and activities. These structural changes may involve adjustments to organizational design, particularly concerning the placement of new digital activities and the extent to which these changes affect products, services, processes, and skills. If the scope of change is limited, integrating new operations into existing structures may be practical. Conversely, for substantial transformations, establishing a separate subsidiary within the parent organization may prove more advantageous.

3.4. Financial Aspects:

The reconfiguration of the three preceding dimensions can only be achieved after carefully considering the financial implications. This encompasses both the organization's urgency to act—often prompted by a declining core business*—and its capacity to finance the digital transformation process. Ultimately, financial aspects act as both a driver and a constraining force for transformation. While minimal financial pressure on the core business might diminish the urgency to initiate such processes, organizations already experiencing severe financial strain may lack the external funding avenues necessary to finance the transformation.



(Matt, Hess, & Benlian, 2015, p. 341)

By understanding the fundamental principles of digital transformation, organizations become capable of developing clear and well-considered plans that enable them to adapt to modern changes and achieve positive long-term outcomes.

4. Strategic Pillars of Digital Transformation

Digital transformation technologies are the outcome of a set of modern digital advancements that operate concurrently with the digital age. Humage highlighted the rapid proliferation of emerging technologies—such as the Internet of Things (IoT), cloud computing, artificial intelligence (AI), and robotics—which have led to the emergence and widespread adoption of digital transformation. Given that improving the efficiency of service-oriented institutions is a fundamental objective, digital transformation has become one of the primary drivers for elevating organizational standing. It contributes directly to strengthening elements of institutional infrastructure, facilitating access to services for beneficiaries, and enhancing the quality of those services. Accordingly, there are several key digital technologies, as outlined below:

- **Internet of Things (IoT):** Generally, one of the primary strengths of the internet is that the information it hosts is available to all users everywhere, as it is not restricted to a specific location or region. Furthermore, this information remains accessible at the time of publication and for many years thereafter, requiring only that the user perform a search. As for the Internet of Things, it is a novel technology that contributes to bridging the gap between the physical and digital worlds, allowing for the sensing and remote control of physical objects. (Khalil, 2005, p. 524).
- **Artificial Intelligence (AI):** These are systems that utilize technologies capable of collecting data and using it for prediction, recommendation, or decision-making—with varying levels of autonomous control—to select the optimal course of action for achieving specific goals. (Boubha, 2022, p. 94).
- **Robotics:** Robotics is also considered one of the remarkable digital transformation technologies of 2020. According to research, approximately one-quarter of organizations utilize smart robots in their operations, and this figure is projected to rise, presenting a promising scenario for both the public and private sectors. The application of robotics has expanded over the years from routine, repetitive tasks

to more complex operations supported by digital transformation technology. In all fields, robotics has played a crucial role in enhancing operational efficiency and in supporting or replacing the human element in high-level tasks or strenuous and dangerous missions. (Zammoura, 2024).

- **Cloud Computing:** This is a model for providing computing services over the internet, where resources such as servers, databases, storage, processing power, and software are offered as a service. These services are provided by cloud computing service providers, and users can access and utilize them remotely without the need to own the hardware or software, simply by connecting to a cloud server via the internet. Cloud computing also aids in reducing costs and increasing the efficiency of resource utilization. (Bourak & Bourak, 2017, p. 53).
- **Big Data:** Data is the fundamental pillar of the digital transformation process. In his study, Serban (2017) highlighted how companies and institutions currently deal with large volumes of data—not merely to make important decisions, but to manage this data effectively. He argues that companies must understand how to manage big data to their advantage and to overcome the challenges they face. Investing in digital technology is no longer viewed merely as providing a competitive advantage; rather, it is considered a standard upon which an institution must rely to successfully navigate the magnitude of its data. (Serban, 2017).

5. Implementing Digital Transformation in Public Organizations

When digital transformation is executed correctly, it is akin to the metamorphosis of a caterpillar into a butterfly; however, when done incorrectly, one is simply left with a fast caterpillar. Consequently, implementing digital transformation in public organizations requires a thorough understanding of their operational mechanics. Indeed, governments possess distinct structures and processes for managing human, financial, and material resources. Thus, digital transformation poses a significant challenge, given the scale and complexity of the task. The most difficult aspect lies in determining, "Where should public organizations begin their digital transformation?" In this regard, public organizations possess varying levels of experience in implementing and utilizing digital tools; some are highly advanced, while others have less experience. This disparity necessitates measuring digital maturity to determine where and how to initiate the transformation process.

5-1. Digital Maturity Assessment

To determine the scope of effort required, it is beneficial to assess the organization's digital maturity to identify its current digital footprint. Based on this diagnosis, an appropriate digital strategy and action plan can then be developed. Furthermore, to monitor progress in business transformation, it is essential to establish objectives to be achieved and ensure effective follow-up. To move forward with the digital transformation of the public sector, those managing public organizations must change their *modus operandi* while ensuring service continuity and striving for improvement. To overcome this obstacle, it is necessary to:

- a. Identify the organization's strengths and weaknesses to pinpoint realistic projects with observable quick wins.
- b. Develop a progressive action plan, working from a forward-looking vision that allows for advancement toward the future.

- c. Ensure public organizations possess the necessary technical skills and integrate them with the expertise of veteran staff who master the operational files (Jacob, Defacqz, & Agousou, 2022).

5-2. Digitizing Initial Processes and Expansion

First, the digital transformation process begins with basic or routine public services. To this end, public organizations start by identifying needs and associated tasks to develop their digital transformation strategy, taking into account their core capabilities regarding new technology.

Second, expanding digital transformation initiatives is essential to improve the experiences of public users—including citizens, institutions, and others—regarding public services. Achieving this goal requires public organizations to consider their core capabilities, which consist of a set of processes and approaches used in decision-making, data sharing and dissemination, as well as the methods and tools used to provide public services and their specific organizational enablers. Organizational enablers include governance elements, organizational strategies, leadership, and culture. These elements help define the organizational priorities for digital transformation that impact the efficiency and quality of administrative activity, while contributing to improving the quality of life for citizens in general and the customer experience in particular (Zammoura, 2024).

5-3. Building User-Friendly Systems

During the transition phase, governments can move toward building more accessible systems for users, ensuring their integration within a unified and coherent framework for all digital offerings provided by the government. At this stage, public organizations can add advanced and distinctive features—similar to those offered by business sector companies—to their services, such as service personalization, mobile and computer application systems, or even the advanced use of artificial intelligence solutions.

Evaluation processes are essential at all step public organizations take in their digital transformation project, as they ensure an understanding of the benefits gained. These can be classified according to the type of impact, the level of impact, the nature of the expected impact, its relative importance and degree of accuracy, and the type of changes and transformations to be achieved within the organization. Decision-makers must choose relevant criteria to estimate and evaluate the benefits of digital transformation projects. To achieve this, they can rely on a structured approach revolving around three elements: Impact (indicating change: improvement, increase, or decrease), Activity Type (the organization's core or supporting activities), and the magnitude of the impact generated at the strategic, tactical, or operational level (Boudreau, 2009).

5-4. Responding to User Expectations

For digital transformation to be effective, new methods must be adopted for the various services available to the public. Usage remains a barrier to digital transformation projects because citizens are not always enthusiastic about using digital public services. However, the barriers to adopting new delivery methods are not insurmountable; there are ways to improve public acceptance of new services. Specifically, collaborative governance mechanisms can be highlighted, which are based on the idea that citizens possess knowledge, skills, or experiences that can contribute to enriching public decisions and designing public services. Consequently, such mechanisms can be an effective means to design and

implement digital public services that meet the needs and expectations of the target audience (Bason, 2018).

5-5. Creativity Breeds Innovation

To restore and maintain citizens' trust, the government can undertake structural reforms driven by new ways of thinking and working, such as Design Thinking. Design Thinking is a human-centered and user-focused approach based on experiences gained from the private sector. In the public sector, Design Thinking seeks to stimulate creative thinking in the decision-making process and accelerate the discovery of solutions. The goal is to equip governments with innovative approaches to address economic challenges of complex social cohesion, unclear governance, and declining trust in government. As a primary driver of innovation, Design Thinking forms the intellectual and practical basis for the co-creation process and reshapes the public sector by overcoming rigid hierarchies or pre-defined categories (Allio, 2014).

5-6. Rethinking Functions and Skill Development

Long before the spread of technology, people were the foundation of public administration. Therefore, when discussing digital transformation, this transition must be treated as a process designed and implemented by, with, and for these people. The public sector faces the challenge of finding the "employees of tomorrow" to hire today. The non-replacement plans often promoted in public administration have demonstrated their limitations, as evidenced by the growing need for skills and talent and the scarcity of candidates for all positions to be filled in the newly transformed public service structures. Many public organizations are falling behind in their digital transformation, a situation attributed specifically to a lack of knowledge or staff training to handle these changes. Digital transformation significantly affects the working methods and conditions of public sector employees. To facilitate these adjustments, organizations must encourage the acquisition of new skills through training and offer support so they can navigate this process (Corydon, Ganesan, & Lundqvist, 2016).

5-7. Redesigning Organizational Structures

Redesigning organizational structures represents one of the strategic dimensions of digital transformation. It is no longer limited to employing digital technologies but involves fundamental changes in organizational structure to ensure alignment with the requirements of the digital environment. This requires transitioning from traditional organizational structures—characterized by centralization and excessive administrative layers—to more flexible and streamlined structures that rely on multidisciplinary teams, horizontal communication, administrative empowerment, and rapid decision-making (Zammoura, 2024).

5-8. Big Data Management

In recent years, many governments have made significant investments in digital transformation reforms, with digital governance through big data management reaching an advanced level in many countries. This abundance of data helps public organizations initiate the second phase of digital transformation—the artificial intelligence phase—thanks to the availability of unprecedented amounts of data collected daily via the internet, social media, telecommunications, digital imagery, platform economies, and the Internet of Things (Alsammed, 2019, p. 22).

6. Challenges of Digital Transformation

One of the most critical challenges hindering the success of organizational digital transformation processes is:

6.1 Organizational Culture

Deficiencies in organizational culture represent one of the most significant challenges organizations face. A prevalent misconception is that digital transformation is solely dependent on upgrading an organization's technology and tools. In reality, digital transformation is not, and has never been, limited to technology alone; it also depends on the organization's ability to adapt to a spectrum of changes. Even when an organization establishes a robust digital transformation strategy, change management remains one of the primary obstacles. Failure to convince employees of the importance of digital transformation can lead to resistance; it is well-established that employees resist change until they are convinced of the positive impact digital transformation will have on their professional and cultural lives. Therefore, fostering a digital organizational culture and maintaining effective communication are key to addressing digitalization challenges. It is essential to encourage employees and other stakeholders to adopt this culture, alongside digital tools and solutions, to ensure alignment with the organization's digital transformation initiatives (Zammoura, 2024, p. 38).

6.2 Lack of IT Resources and Management

Poor resource management planning, particularly concerning information technology, is a major impediment to digital transformation. Furthermore, the shortage of specialized skills and the difficulty in acquiring IT talent serve as significant barriers to success. According to (Capgemini Consulting, 2013), 77% of organizations identify the lack of digital skills as the primary obstacle to their digital transformation efforts.

6.3 Ambiguity in Digital Transformation Budgeting

A primary obstacle stalling projects is the funding strategy required for digital transformation. For most organizations, allocating a limited budget to achieve successful digital transitions can be daunting. To drive effective digital transformation, organizations must invest in both appropriate technologies and teams possessing the necessary digital expertise for implementation.

6.4 Cybersecurity

Cybersecurity presents a major challenge due to the escalating risks of cyberattacks. This requires the strengthening of digital security infrastructure and the development of robust, effective strategies to protect data and information (Ben Ahmed & Ben Ahmed, 2025, p. 507).

7. Conclusion

Algeria has made significant strides in its digital transformation journey by adopting a comprehensive array of programs and reforms aimed at digitizing government organizations, developing e-services, and enhancing digital infrastructure. This progress reflects a clear commitment to keeping pace with global technological shifts. However, despite their significance, these efforts continue to face a set of challenges that impede comprehensive digital transformation. Key among these are the disparities in digitization levels across government institutions, the limited digital competencies of certain personnel, resistance to organizational change, as well as inadequate inter-agency coordination, the

urgent need to update legislation governing digital transformation, and the necessity of strengthening cybersecurity frameworks and data governance.

In light of the above, it can be concluded that digital transformation serves as a foundational pillar for establishing modern, digital government entities capable of navigating future challenges. Nevertheless, achieving these objectives remains contingent upon the ability of government organizations to manage change in a scientific manner, allocate the necessary resources, and foster cooperation among various stakeholders. Such measures will contribute to elevating government performance, bolstering citizen trust in public institutions, and supporting the trajectory toward an effective e-government that meets contemporary requirements and aligns with international best practices.

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