The Legal Regulation of E-Administration: Between the Requirements of Digital Transformation and Legal Challenges

Dr. Hamid Zegaoui - Hassiba Benbouali University of Chlef – UHBC; h.zegaoui@univ-chlef.dz

Dr. Mekheldi Abdelkarim

mekheldiabdelkarim@gmail.com

Dr. Nadjet Tahraoui - Hassiba Benbouali University of Chlef – UHBC

nadjettahraoui9@gmail.com

Abstract

The study focuses on highlighting the legislative regulation of electronic administration by examining its governing legal framework and analyzing the main legal challenges that prevent its actual implementation. The study adopted the descriptive and analytical approach by reviewing the relevant legal texts and assessing their adequacy in keeping pace with digital transformation. It concluded that the transition towards electronic administration raises a number of issues, particularly those relating to the protection of personal data, the legal validity of electronic documents and signatures, as well as the dispersion of legal texts and the difficulty of achieving integration between digital administrative systems. The study concluded with the necessity of modernizing the legislative system and developing an integrated legal framework that ensures the protection of rights and freedoms, strengthens trust in electronic transactions, and contributes to achieving legal security and establishing effective and sustainable electronic administration.

Keywords: Electronic Administration, Legislative regulation, Legal Challenges, Digital Transformation, Legal Certainty.

Received: 02/08/2026; Accepted: 28/09/2026; Published: 02/11/2026

La regulación jurídica de la administración electrónica: entre las exigencias de la transformación digital y los desafíos jurídicos

Dr. Hamid Zegaoui — Universidad Hassiba Benbouali de Chlef – UHBC
h.zegaoui@univ-chlef.dz

Dr. Mekheldi Abdelkarim
mekheldiabdelkarim@gmail.com

Dra. Nadjet Tahraoui — Universidad Hassiba Benbouali de Chlef – UHBC
nadjettahraoui9@gmail.com

Resumen

El presente estudio examina la regulación legislativa de la administración electrónica mediante el análisis del marco jurídico que la rige y de los principales desafíos jurídicos que obstaculizan su implementación efectiva. Se adopta un enfoque descriptivo y analítico, basado en la revisión de los textos jurídicos pertinentes y en la evaluación de su adecuación a las exigencias de la transformación digital. Los resultados muestran que la transición hacia la administración electrónica plantea diversas cuestiones, especialmente en relación con la protección de los datos personales, la validez jurídica de los documentos y las firmas electrónicas, así como con la dispersión normativa y las dificultades para lograr la integración de los sistemas administrativos digitales. El estudio concluye que es necesario modernizar el ordenamiento jurídico y desarrollar un marco normativo integrado que garantice la protección de los derechos y las libertades, refuerce la confianza en las transacciones electrónicas y contribuya a garantizar la seguridad jurídica y a consolidar una administración electrónica eficaz y sostenible.

Palabras clave: Administración electrónica, regulación legislativa, desafíos jurídicos, transformación digital, seguridad jurídica.

Introduction

It is beyond dispute that the integration of digitalization into the management of public services has become a necessity imposed by rapid technological progress. This has required the transfer and adoption of digital technology across various aspects of administration, with the aim of enhancing the speed and flexibility of procedures, improving performance, and strengthening citizens' trust in the administration, this highlights the importance of digital transformation and its impact on the quality of administrative services.

The process of modernizing administration in Algeria depends on the need to provide a robust and solid infrastructure, in addition to qualifying and training human resources, as they are one of the most important components of digital administration and constitute the digital leadership capable of managing change. However, the modernization of administrative performance continues to face challenges that hinder the implementation of electronic administration in all its dimensions.

On this basis, this study aims to address the following research question: How can digital transformation be implemented in public administration in light of the existing challenges?

Section One: The Concept of Digital Transformation in Public Administration

At this stage of the study, we seek to shed light on the concept of administrative digitalization, identify its main components, and examine the objectives it pursues in relation to the quality and efficiency of administrative work.

First: Definition of Administrative Digitalization

This term first emerged in the United States of America. Administrative digitalization, or electronic administration, can be defined as follows: “An administrative strategy for modernizing information, aimed at providing better services to citizens and institutions, while making optimal use of available information resources through the deployment of available material, human, and intangible resources within a modern electronic framework, in order to make optimal use of time, money, and effort, meet the intended needs, and achieve the required quality.” (Mohamed, 2022, p. 12)

Some experts in administrative digitalization have further defined it as follows: “An administration without paper and a means of enhancing the performance and efficiency of authority, relying primarily on technological means.” (Chnoufi, 2009/2010)

Others have considered electronic administration to be the implementation of all government services and transactions provided to citizens or business sectors through databases and information networks, using modern communication technologies. This enhances the efficiency and effectiveness of government performance within an interactive framework between the service provider and the service recipient (Zouheir, 2014, p. 4).

Professor Alaa Abdel Razzaq Al-Salmi also provided a definition of electronic administration from a functional perspective, considering it to be: “The process of eliminating paper-based transactions and replacing them with an electronic library that relies on information technology by transforming public services into office procedures carried out according to sequential steps.” (Alaa, 2007, p. 32)

The World Bank, for its part, has defined electronic administration as the use of information and communication technologies to change the way citizens interact with business and government institutions, thereby enabling them to participate in decision-making, enhance transparency, and support society (Wahiba, 2018/2019, p. 4).

In general, electronic administration can be considered the use of the outputs of the technological revolution to improve institutional performance, enhance effectiveness, and increase efficiency in achieving planned objectives. It is not limited to providing services to citizens electronically; rather, it also aims to use these

technologies in internal and external management activities, in accordance with information technology methods, and in dealings with all stakeholders alike, in order to ensure transparency.

Ultimately, based on the foregoing, electronic administration can be defined as the use of the outputs of the technological revolution to improve the performance of administrative institutions, enhance their effectiveness, and increase their efficiency in achieving planned objectives. It should be noted that it is not limited to providing services to citizens electronically; rather, it aims to use these technologies in internal and external management activities, using information technology methods in dealings with all stakeholders alike, in order to ensure transparency.

Second: Components of Digital Administration

Digital administration is primarily based on equipment designed to provide services to users in accordance with information technology methods, in addition to the various software programs used for this purpose, as well as the need for digital intellectual leadership.

A. **Technical Infrastructure:** This includes computers and their peripherals, given their widespread use, which contributes to the effective digitalization of administrative services. This has made it necessary for public administration to possess the latest hardware available in this field.
B. **Software and Smart Applications:** This includes various software programs and information systems, such as human resource management systems, financial systems, electronic archiving, and others. As for networks, they represent electronic connections extending through a communication network comprising intranets, extranets, and the Internet, which together constitute the institution's value network and that of its electronic administration.
C. **Digital Leadership:** This includes qualified human resources, such as managers and knowledge resource analysts, who constitute what is known as intellectual capital, owing to their skills in dealing with modern technologies and their capacity for digital leadership and change management, in order to develop a culture of electronic knowledge.

Third: The Role of Electronic Administration in the Quality of Public Services

There is no denying that the need for public administration to adopt digital transformation is no less significant than that of the private sector, given that the continuation of traditional administrative management methods creates bureaucratic crises and rigidity in the provision of public services. This highlights the importance of electronic administration. Nevertheless, several obstacles and challenges have been identified in implementing this approach, which focuses on change management, and these will be addressed in the following sections of the study.

Electronic administration is considered a modern alternative that keeps pace with the developments that have transformed individuals' lives and meets their administrative needs and demands. The widespread implementation of technological applications in administration is not merely a modern lifestyle choice; rather, it is an urgent necessity for society and a driving force for administration to move beyond its current reality and venture into broader global horizons at a rapid pace and with extensive participation (Hussein, 2009, p. 3).

The role of digitalization is accentuated through the following:

- Improving administrative performance efficiency.
- Strengthening trust and transparency by enhancing citizens' confidence and ensuring a rapid response.
- Reducing and addressing bureaucracy by overcoming the complexities of traditional administration and accelerating service delivery.
- Developing and modernizing documents by digitizing national records, such as civil status documents, and introducing biometric documents.
- Modernizing the public sector, particularly at the level of local authorities and municipalities.

There is no doubt that numerous challenges face the digitalization of public administration, whether human, structural, or technical in nature, in addition to obstacles related to the shortage of qualified personnel. These challenges can be summarized as follows:

- **Human and cultural challenges:** The most significant of these is employees' resistance to change for personal or professional reasons, such as inadequate training and qualification.
- **Financial and organizational challenges:** These include limited budgets allocated to long-term digitalization projects, the absence of planning, and obstacles associated with converting paper documents into digital formats.
- **Technical challenges:** These include the obsolescence of existing systems and the difficulty of integrating them with modern platforms, weak Internet networks, a shortage of hardware, as well as security challenges related to data protection.
- **Legal challenges:** The most significant of these is the failure to establish a comprehensive legislative framework capable of accommodating modern electronic services and addressing and regulating various digital transactions.

Section Two: Legislative Provisions Governing Electronic Administration and the Main Legal Challenges

Given that digital transformation has come to dominate legal systems around the world, digital governance has become a necessity rather than merely an option for the functioning of service-providing institutions. In accordance with this, establishing a clear understanding of its legal concept constitutes a fundamental reference that enables the use of digital technologies with confidence, security, and efficiency. Consequently, this section will examine the role of digital governance in enhancing institutional performance and its relationship with digital transformation, considering the latter as the primary means of achieving digital governance.

First: The Legislative Regulation of Electronic Administration in Algeria:

The Algerian legislator has adopted a set of legislative texts regulating various electronic transactions, including Executive Decree No. 98-275 (Executive Decree No. 98-275 of August 25, 1998), regarding the establishment of the conditions and procedures for setting up and operating Internet services, and Executive Decree No. 2000-307 (Executive Decree No. 2000-307 of October 14, 2000), concerning the determination of the conditions and standards for regulating and benefiting from the Internet.

Additionally, Law No. 2000-03 (Law No. 2000-03 of August 5, 2000) establishes the general rules relating to postal services and telecommunications. It should also be noted that the Algerian legislator recognized the

legal validity of electronic writing through Law No. 05-10 (Article 323 bis of the Civil Code, 2005), which amended the Civil Code (legal validity of electronic signatures, electronic certification, and electronic payment methods).

At this stage of the study, we will analyze the aforementioned legal texts and examine the main legal provisions established by the Algerian legislator specifically concerning electronic transactions.

It is worth noting at the outset that the legislator recognized the legal right and capacity of any person, whether a natural or legal person, to be a party to electronic agreements intended to be concluded. It also established a legal framework governing electronic transactions, from the stage of creating an electronic legal act to the stage of its execution and the resulting legal effects.

As previously mentioned, the legislation in force considers digital exchange an electronic means of proof, through its recognition of the legal validity of electronic writing and its recognition of electronic signatures under Law No. 05-10 amending the Algerian Civil Code, these are the means adopted for concluding electronic legal acts.

In this particular context, the legislator enacted Law No. 15-04 (Law No. 04-15 of November 10, 2004), dated February 1, 2015, establishing the general rules relating to electronic signatures and electronic certification. Article 2 of this law defines an electronic signature as follows: “Data in electronic form attached to or associated with other electronic data and used as a means of authentication.”

With the aim of providing the requisite legal protection, the legislator did not limit itself to encrypting electronic signatures in electronic transactions but also required the certification of electronic signatures to ensure the highest possible level of protection for the signatory. Electronic certification refers to the process carried out by a competent authority to verify the identity of the electronic signatory through information and communication systems.

Electronic certification service providers must be qualified to perform this task. In recognition of the importance of their assigned responsibilities, the Algerian legislator regulated the substantive aspects of their duties and defined them in Article 2 of Law No. 15-04, relating to electronic signatures and electronic certification, as follows: “A natural or legal person who issues qualified electronic certification certificates and may provide other services in the field of electronic certification.”

Subsequently, an electronic certification service provider is entrusted with the task of certification to guarantee the authenticity of electronic data by issuing an electronic certification certificate, which the Algerian legislator defined in Article 2, paragraph 7, of the aforementioned Law No. 15-04 as follows: “A document in electronic form that establishes the link between the electronic signature verification data and the signatory.”

It is worth noting that the legislator introduced another type of certificate, known as a qualified electronic certification certificate, under Article 15 of Law No. 15-04. The law requires that it be issued by a trusted third party or by an electronic certification service provider and that it contains mandatory information, including an explicit indication that it is a qualified electronic certification certificate and the identity of the entity that issued it.

Electronic administration can also be understood as the implementation of all government services and transactions provided to citizens or business sectors through databases and information networks, using modern communication technologies, thereby enhancing the efficiency and effectiveness of government performance within an interactive framework between the service provider and the service recipient (Zouheir, 2014, p. 4).

Professor Alaa Abdel Razzaq Al-Salmi also provided a definition of electronic administration from a functional perspective, considering it to be: "The process of eliminating paper-based transactions and replacing them with an electronic library that relies on information technology by transforming public services into office procedures carried out according to sequential steps." (Alaa, Electronic Administration, 2007, p. 32)

The World Bank, for its part, has defined electronic administration as the use of information and communication technologies to change the way citizens interact with business and government institutions, thereby enabling them to participate in decision-making, enhance transparency, and support society (Wahiba, 2018/2019, p. 4).

In broad terms, electronic administration can be considered the use of the outputs of the technological revolution to improve institutional performance, enhance effectiveness, and increase efficiency in achieving planned objectives. It is not limited to providing services to citizens electronically; rather, it also aims to use these technologies in internal and external management activities, in accordance with information technology methods, and in dealings with all stakeholders alike, in order to ensure transparency.

Second: Legal Challenges to the Implementation of Electronic Administration:

There is no doubt that numerous challenges face the digitalization of public administration, whether human, structural, or technical in nature, in addition to obstacles related to the shortage of qualified personnel, these include human and cultural challenges, the most significant of which is employees' resistance to change for personal or professional reasons, such as inadequate training and qualification. They also include financial and organizational challenges, particularly limited budgets allocated to long-term digitalization projects, the absence of planning, and obstacles associated with converting paper documents into digital formats.

Technical challenges must also be noted, including the obsolescence of existing systems and the difficulty of integrating them with modern platforms, weak Internet networks, a shortage of hardware, and security challenges related to data protection.

As for the legal challenges, which are the primary focus of this study, they can generally be summarized as the failure to establish a comprehensive legislative framework capable of accommodating modern electronic services and regulating the various forms of digital transactions.

In accordance with this, despite the existence of indications of a comprehensive strategy towards the transition to electronic administration in Algeria, the implementation of this strategy continues to face several obstacles, perhaps the most significant of which are legal in nature. This is because the establishment of electronic administration is fundamentally linked to the need to create a legislative environment that serves as a primary reference for regulating digital transformation.

Accordingly, it is necessary to examine the main legislative challenges facing the implementation of digital administration:

- Although Algeria has adopted an electronic administration project, the reality of transactions has revealed obstacles and constraints that significantly hinder its implementation in a manner consistent with its intended objectives. Particular attention should be given to those relating to the legislative dimension, since the transition towards electronic administration depends on the existence of an appropriate legislative environment.
- The absence of a reference legal framework at the central administration level: There is no unified legal framework responsible for coordinating and planning the implementation of digital transformation programs. This results in a lack of coordination during the various stages of concluding electronic legal acts, as a natural consequence of the absence of a clear and unified plan that ensures secure, comprehensive, and stable electronic implementation.
- The inadequacy of traditional legal texts in regulating electronic transactions: Traditional legislation does not sufficiently cover the regulation of electronic transactions, given their specific characteristics, from their formation and creation to their execution and the resulting legal effects. This has created a clear legal gap due to the absence of appropriate legislative provisions.
- Legislative weaknesses in regulating electronic commercial activities and practices, the absence of legal provisions governing the methods of concluding commercial legal acts electronically and the reciprocal obligations they create between the parties reduces the willingness of traders and individuals to adopt this type of transaction.
- Limited recognition of the legal validity of electronic documents as evidence, this limitation weakens confidence in electronic transactions, given that legal rules primarily aim to regulate relationships between individuals in a manner that promotes stability. The further legal transactions move away from stability and trust, the more reluctant individuals become to engage in this type of transaction.
- The absence of a comprehensive legal framework governing the digital sector. There is no comprehensive legal system that regulates the digital sector and ensures the establishment of digital transformation through legal provisions designed to regulate relationships and provide legal solutions to the various issues that arise.
- Weak legal mechanisms for protecting personal data, and challenges related to the secure management and operation of electronic programs have increased concerns about information security. These concerns stem from the possibility of information system breaches and the resulting threats to privacy and confidentiality. This creates an inadequately protected electronic environment, particularly in the absence of software and mechanisms that ensure effective legal oversight of security breaches.
- Obstacles relating to the regulation of electronic contracts, significant difficulties arise, particularly concerning contracts that require official formalities and legal procedures, such as registration and publication, as well as certain legal acts and contracts that require judicial intervention or supervision for their conclusion.
- Legal restrictions affecting certain electronic acts within public services, some acts continue to face legal restrictions within public institutions. Electronic signatures, for instance, still encounter challenges that prevent their full recognition as legally valid instruments. Similar difficulties arise with electronic fingerprints and the use of email, all of which present challenges concerning the establishment and verification of electronic identity.
- The inadequacy of existing regulations governing electronic administration, currently applied to administration and electronic transactions have not yet been sufficiently adapted to regulate working relationships and cooperation within electronic administrations.

- The absence of criminal law provisions addressing certain serious forms of cyber misconduct, this includes the lack of specific criminal provisions addressing certain dangerous acts involving the hacking of electronic administration networks, including breaches affecting bank accounts, confidential documents, and trade secrets belonging to companies participating in commercial competition.
- The absence of central administrative bodies responsible for evaluating digital transformation programs, there are no designated bodies at the central administration level tasked with examining reports submitted by committees responsible for evaluating digital transformation programs and making the necessary decisions to improve and enhance the digital readiness index (Ben Dlimi, 2023, p. 18).
- The lack of legislative balance between digital transformation and data protection: There is an insufficient balance between the need to establish an electronic environment within legal frameworks that facilitate digital transformation, on the one hand, and the need to ensure personal data protection and cybersecurity, on the other.

Conclusion

To conclude, this study establishes that the digital transformation of public administration should be comprehensive rather than merely a technical process. This requires providing stable infrastructure, ensuring cybersecurity, and offering specialized training for employees while developing their skills in order to improve job performance.

There is no doubt that adopting digitalization within public administration can improve organizational efficiency through the use of technological performance and the acceleration of administrative procedures. This requires the provision of strong and comprehensive infrastructure, the allocation of the necessary financial resources to support and advance digitalization in its various aspects, as well as the establishment of a comprehensive legal framework that supports the use of digital technologies across different sectors.

Results:

- The study showed that the effectiveness of electronic administration does not depend solely on digitizing administrative procedures; rather, it is linked to the adequacy of the legislative framework in regulating them and keeping pace with legal challenges, including those relating to the legal validity of electronic documents and signatures.
- The effectiveness of electronic administration is linked to the clarity and consistency of the legal texts governing it.
- The multiplicity and fragmentation of legal texts affect the achievement of legal certainty within the digital administrative environment.

Recommendations:

- The legislative framework must be updated to reflect rapid technological developments.
- Efforts should be made to establish an integrated legal framework regulating the various aspects of electronic administration and defining the rules governing the resulting legal liability.
- Legal safeguards for the protection and security of electronic administrative transactions should be strengthened.
- The legal validity of electronic documents and signatures should be formally recognized, with clear rules established for their legal admissibility.

- Coordination between administrative institutions should be strengthened, and digital procedures should be standardized to ensure the effectiveness and continuity of electronic administration.

References

1. Alaa, A. R.-S. (2007). *Electronic Administration.* Amman, Jordan: Wael Publishing House.
2. Alaa, A. R.-S. (2007). *Electronic Administration.* Amman, Jordan: Wael Publishing House.
3. Article 323 bis of the Civil Code, O. N.-5. (2005, June 22). as amended and supplemented by Law No. 05-10 concerning electronic signatures and authentication, Official Gazette, No. 44.
4. Ben Dlimi, S. (2023). Quality of Services in the Context of Digital Transformation and Electronic Administration in Algerian Institutions. *Requirements for Implementing Electronic Administration in Service Institutions.* Batna: University of Batna 1, Hadj Lakhdar.
5. Chnoufi, N. (2009/2010). *Public Management, target audience: employees applying for the rank of administrative officer, University of Continuing Education.* Algeria.
6. Executive Decree No. 2000-307 of October 14, 2. (2000). concerning the determination of the conditions and standards for regulating and benefiting from the Internet, Official Gazette, No. 60.
7. Executive Decree No. 98-275 of August 25, 1. (1998). concerning the establishment of the conditions and procedures for setting up and operating Internet services, Official Gazette, No. 62.
8. Hussein, b. M.-H. (2009). *Electronic Administration Between Theory and Practice.* Riyadh, Jordan: King Abdulaziz Public Library.
9. Law No. 04-15 of November 10, 2. (2004, November 10). relating to the suppression of offences associated with information and communication technologies, Official Gazette, No. 71.
10. Law No. 2000-03 of August 5, 2. (2000, August 6). establishing the general rules relating to postal services and telecommunications, Official Gazette, No. 48.
11. Mohamed, H. K. (2022). Digital Transformation in Algeria in Light of the Challenges of Digitalizing the Economy and Public Administrations. *Journal of Legal and Economic Studies, 5*(2).
12. Wahiba, F. (2018/2019). *Electronic Administration as a Mechanism for Improving Public Service: A Case Study of the Municipality of Bouira, Master's thesis.* Faculty of Economic, Commercial and Management Sciences, Akli Mohand Oulhadj University, Bouira, Algeria.
13. Zouheir, S. (2014). *Electronic Administration as an Approach to Improving Performance in Public Institutions, Master's thesis.* Mohamed Khider University, Biskra, Algeria.