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# Electronic Administration: A Study of Conceptual Implications and Theoretical Approaches

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Abstract ;

Electronic administration ranks among the most prominent phenomena to emerge from the information and communications revolution at the dawn of the third millennium, having brought about a fundamental transformation in the structure of governmental work and the system of public service delivery. This article aims to provide an in-depth academic examination of electronic administration through three primary axes: first, the theoretical conceptual approach, which analyses multiple definitions and highlights related concepts; second, a historical tracing of the concept's development from its origins to the present; and third, a review of the major theories that have contributed to shaping the analytical frameworks of this knowledge field. The article concludes that electronic administration is not merely a technical tool, but rather a comprehensive governance system that reformulates the relationship between the state and the citizen on the foundations of efficiency, transparency, and participation.

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## Introduction

The world witnessed, at the close of the twentieth century and the beginning of the twenty-first, rapid and radical transformations across diverse economic, social, and political domains. At the core of these transformations lay the informational and technological revolution, which overturned the foundations of the traditional administrative order. Since the digital economy established its foundations and the internet expanded to encompass billions of users worldwide, the question of the future of public administration and its mechanisms for engaging with citizens became one of the most pressing issues in contemporary administrative and political thought.

In this context, electronic administration emerged as a comprehensive transformative concept that transcends the limits of simple administrative automation to touch the very essence of the relationship between the state and its citizens. Developed nations channelled substantial investments into upgrading their digital infrastructure and adopted ambitious national strategies to migrate their services to an electronic environment, while developing countries—including Algeria—hastened to engage with this new civilisational trajectory under the pressure of development requirements and the reform of governance systems.

Academic scholarship in the field of electronic administration reveals a rich theoretical diversity and a plurality of approaches and analytical frameworks, which necessitates a careful examination of the foundational concepts, their developmental trajectories, and the theories that underpin their scientific foundations. This is precisely what the present article seeks to accomplish, drawing upon established academic literature and documented references from multiple scholarly sources.

The central research problem is encapsulated in the following pivotal question: What is the conceptual and theoretical framework that enables an understanding of electronic administration as an integrated governance phenomenon rather than a mere technical tool? From this question derive several subsidiary enquiries concerning the multiple definitions and the points of divergence and convergence among them, the developmental trajectory of the concept over time, and the theories that have contributed to shaping this knowledge field.

This article adopts the descriptive-analytical method, drawing upon the historical method for tracing conceptual development, as well as content analysis methodology for examining theories and definitions.

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Section I: The Theoretical Conceptual Approach to Electronic Administration

1.1 Definition of Electronic Administration

The precise definition of any scientific concept constitutes the foundational pillar upon which theoretical and applied studies are constructed. The concept of electronic administration has witnessed a notable multiplicity of definitions reflecting the diversity of perspectives and the variety of disciplines concerned with it—from public administration and political science and information technology to economics, law, and sociology.

At the international level, the United Nations has defined electronic administration (e-Government) as "the use of the internet and wide-area network communication technologies by governments to improve the quality of services provided to citizens and the business sector, as well as to provide information and enhance effective communication with all segments of society ." This definition reveals three interrelated dimensions: the technical dimension, embodied in the actual use of information technology; the service dimension, concerned with improving service efficiency; and the communicative dimension, aimed at enhancing interaction between the state and society.

The World Bank adopted a broader perspective when it defined electronic administration as "the use of information and communication technologies by government agencies to transform their relationships with citizens, the business sector, and other government bodies through improved government service delivery, enhanced interaction with the business and industrial sector, citizen empowerment and activation of their role in the governance process, and rationalisation of the internal management of government ." This definition draws attention to the dimension of transformation in the relationships themselves, rather than merely improving mechanisms of performance.

American scholar Darrell Norris put forward a more expansive definition, viewing electronic administration as "the continuous application of information and communication technology to transform the relationships within government and between government and citizens and businesses, in order to achieve good governance ." Norris adds an important dimension of continuity, conceiving of it as a permanent process rather than a time-limited project.

In contrast, a number of Arab scholars opted for definitions that foreground the organisational dimension. Scholar Ali Muhammad Rababah defined it as "the deployment of information and communication networks and the utilisation of their applications in modernising governmental and non-governmental organisations, with a view to

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raising their internal efficiency and elevating the quality of their services to clients and stakeholders in a manner that transcends the constraints of time and place."

It is worth noting that academic literature frequently features an intermingling of several terms related to the concept of electronic administration, chief among them: e-government, digital transformation, government information management, and smart city—a situation that necessitates a clear distinction among these terms.

### 1.2 Related Concepts

The concept of electronic administration cannot be fully comprehended in isolation from its surrounding conceptual framework, as a number of fundamental concepts share with it both technical foundations and governance objectives. These concepts may be presented as follows:

a. E-Government: A segment of scholars considers e-government and electronic administration to be identical concepts, whilst another segment distinguishes between them on the basis of scope: e-government is the broader term, encompassing the political and legislative dimensions alongside the administrative one, whereas electronic administration focuses on the executive and service-oriented aspects .

b. Digital Transformation: Digital transformation represents a more comprehensive concept signifying the fundamental restructuring of governmental processes, strategies, and organisational culture on digital foundations, transcending the mere digitisation of documents or the provision of services via the internet .

c. E-Governance: E-governance extends to encompass, in addition to service delivery mechanisms, the system of electronic political participation, participatory decision-making, and digital oversight. In more precise terms, it addresses the political dimension of the digital transformation, just as electronic administration addresses its organisational dimension .

d. Smart City: A concept centred on the deployment of Internet of Things technologies, big data, and artificial intelligence in urban management and the improvement of urban quality of life. It represents a more advanced and integrated stage of electronic administration .

e. Government Information Management: This concept addresses the internal dimension of the use of information technology in organising documents, archives, and information flows within governmental bodies. It constitutes an essential infrastructural prerequisite for any successful electronic administration system .

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Section II: The Development of the Concept of Electronic Administration

**2.1 Historical Roots: From Automation to Networking (1960–1990)**

The actual history of employing technology in governmental work extends to the 1960s, when Western governments—most notably the United States—began using mainframe computers to process population census data and tax calculations. This phase was characterised by what is known as "administrative automation," which converted manual paper-based processes into mechanised ones without altering the structure of service delivery itself.

In the 1980s, with the proliferation of personal computers and the emergence of database management systems, governmental administration transitioned to a new phase known as "public administration informatics," whereby government employees gained the ability to access and update information more rapidly and accurately. However, these systems remained largely closed and confined to internal use .

**2.2 The Internet Phase and Early Electronic Services (1990–2000)**

The proliferation of the commercial internet in the early 1990s constituted a decisive turning point in the history of electronic administration. The World Wide Web enabled governments to provide governmental information to citizens around the clock and across geographic borders, thereby establishing the first interactive dimension of electronic administration. In the United States, the Clinton administration launched the "Reinventing Government" initiative in 1993, which laid the foundations of American digital administration .

During this phase, researchers identified three progressively advanced levels in the development of e-government services: publication (dissemination of information on the web), interaction (two-way communication between the citizen and the governmental body), and transaction (the completion of full administrative procedures via the internet) .

**2.3 The Maturity and Integration Phase (2000–2010)**

The third millennium witnessed a global proliferation of electronic administration projects, as nations competed to design national strategies and launch unified governmental portals. The member states of the European Union adopted the "eEurope" initiative in 2000, while Singapore, Australia, and Canada launched pioneering projects that became internationally emulated models.

This phase contributed to the generation of a substantial body of knowledge concerning frameworks for measuring the level of electronic administration and for classifying countries. Chief among these

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frameworks is the United Nations E-Government Development Index, published regularly since 2001, which measures the extent to which governments have adopted digital technologies in public service .

### 2.4 Electronic Administration in the Age of Artificial Intelligence and Big Data (2010 to the Present)

The current phase represents a qualitative leap in the trajectory of electronic administration, having transcended the boundaries of traditional technologies to integrate artificial intelligence, big data analytics, the Internet of Things, and cloud computing at its core. The matter is no longer confined to the provision of services electronically; rather, it extends to anticipating citizens' needs and customising services in accordance with the individual context of each user .

The COVID-19 pandemic of 2020 accelerated this transformation at an unprecedented rate, as exceptional circumstances compelled governments to digitise a broad spectrum of public services in a short period, simultaneously exposing acute digital divides between developed and developing nations .

## Section III: Theories of Electronic Administration

Electronic administration derives its theoretical frameworks from multiple knowledge tributaries that intersect and complement one another within a dynamic context. These theories are distributed between those drawn from traditional public administration and adapted to the digital environment, and those newly developed specifically to accommodate the characteristics and complexities of the digital world. The following is a detailed review of the major theories in this field:

### 3.1 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) represents one of the most widely employed and profoundly influential theories in studies related to electronic administration. It was developed by researcher Fred Davis in 1989, drawing on the Theory of Reasoned Action of Fishbein and Ajzen. The theory rests on a fundamental premise that user acceptance of technology is determined by two core variables:

- Perceived Usefulness: the degree to which a user believes that using a specific technology will enhance their level of performance and productivity.

- Perceived Ease of Use: the degree to which a user believes that interacting with the technology will not require considerable effort .

The TAM model has undergone successive refinements. Venkatesh and Davis introduced TAM2 in 2000, incorporating social and cognitive variables such as

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subjective norms, image, and job relevance. This trajectory culminated in the Unified Theory of Acceptance and Use of Technology (UTAUT), developed by Venkatesh and colleagues in 2003, which synthesises eight prior models into an integrated theoretical framework and attributes technology acceptance behaviour to four primary drivers: performance expectancy, effort expectancy, social influence, and facilitating conditions .

TAM finds direct application in understanding the determinants of citizens' acceptance or rejection of electronic governmental services—a question that has prompted extensive empirical studies across diverse cultural and contextual environments, frequently yielding divergent results that affirm the importance of contextual and cultural factors in shaping user attitudes.

### 3.2 Diffusion of Innovations Theory

Communication scholar Everett Rogers formulated the Diffusion of Innovations theory in his seminal work Diffusion of Innovations, first published in 1962 and subsequently revised on several occasions. It stands as one of the most widely disseminated theories in studies of technology acceptance and social change. The theory analyses the manner in which new ideas and technologies spread within societies over time .

The theory identifies five principal determinants of the rate of innovation diffusion: (1) relative advantage—the clear superiority of the innovation over what preceded it; (2) compatibility—the degree of alignment between the innovation and the values, needs, and prior experiences of potential adopters; (3) complexity—the degree of difficulty in understanding and using the innovation; (4) trialability—the possibility of testing the innovation prior to full adoption; and (5) observability—the visibility of the innovation's results to others.

The theory classifies adopters according to an adoption curve into five categories: Innovators, Early Adopters, Early Majority, Late Majority, and Laggards. These classifications are applied to nations within the framework of electronic administration to understand disparities in adoption levels and to identify the factors that accelerate or retard diffusion .

### 3.3 E-Government Maturity Models

The maturity or development model constitutes one of the most important analytical frameworks specific to electronic administration, serving as a tool for measuring progress and charting a roadmap. The most notable among these models are as follows:

First — The Layne & Lee Model (2001): Researchers Layne and Lee proposed a four-stage model in which the degree of service integration progressively increases: (1) the Cataloguing stage, in which basic information is made available on the

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internet; (2) the Transaction stage, in which administrative procedures are completed automatically via the network; (3) the Vertical Integration stage, in which systems are unified across different levels of government (local, regional, national); and (4) the Horizontal Integration stage, in which services are integrated across multiple ministries and agencies to deliver a unified governmental service .

Second — The United Nations Five-Stage Model: Developed by the United Nations to encompass five stages: Emerging, Enhanced, Interactive, Transactional, and Connected. The Connected stage represents the ultimate goal, wherein e-government interacts comprehensively with citizens across all dimensions of public life .

### 3.4 Social Capital and Citizen Trust Theory

Electronic administration has necessitated the deployment of the concept of social capital as established by Putnam (1993) and Coleman (1988). Studies have demonstrated that the level of social trust—whether interpersonal trust (horizontal trust) or trust in governmental institutions (vertical trust)—constitutes a pivotal factor in determining citizens' propensity to use electronic governmental services.

With regard to electronic administration, research distinguishes three types of trust essential to the success of any electronic initiative: trust in the technology itself (system reliability and information security), trust in the service provider (the governmental institution), and trust in the internet as a secure medium for transactions. The study by Carter and Belanger (2005) demonstrated that trust and the social acceptability of innovation (drawing on Rogers' theory) are among the most statistically significant predictors of citizens' intention to use e-government services .

### 3.5 New Public Management Theory (NPM)

New Public Management (NPM) occupies a pivotal position in the intellectual context that gave rise to electronic administration. This theory emerged in the 1980s in the context of administrative reforms in Britain, New Zealand, Australia, and the United States. It is grounded in a set of core principles that draw upon private-sector management practices to reform the governmental apparatus, chief among them: an orientation towards results and efficiency, the activation of competition in public service delivery, the centrality of the citizen-as-customer, and transparency and accountability.

New Public Management furnished electronic administration with powerful justifications, finding in digital technology the optimal instrument for applying its principles of cost reduction, service efficiency enhancement, and citizen empowerment. Some scholars have argued that e-government in its early form was, at



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its core, no more than a digital extension of the New Public Management project.

However, the criticisms levelled against NPM—particularly its disregard for democratic values and the public interest—prompted scholars such as Dunleavy and colleagues to formulate an alternative model they termed "Digital-Era Governance," which reinstates the public interest and incorporates integration and holism as alternatives to the fragmentation that characterised the NPM approach .

### 3.6 Network Governance Theory

The interconnected digital environment, with its multiple dimensions, prompted recourse to Network Governance Theory to understand how decisions are made and policies coordinated in an electronic space characterised by multiple actors and interwoven interests. This theory draws on social network analysis and multi-level governance science, affirming that the act of governing in the digital environment shifts from a model of centralised hierarchy towards more horizontal and participatory models that encompass the government, the private sector, civil society, and citiens simultaneously .

### 3.7 Digital Divide Theory

No study of electronic administration is complete without invoking the concept of the digital divide, which refers to disparities in access to and actual use of information and communication technology. According to Van Dijk, this concept extends across four successive levels: a motivational gap (the willingness to access), a physical access gap (equipment and connectivity), a skills gap (digital competence), and a usage gap (effective and productive deployment of technology). The digital divide constitutes a twofold structural challenge in the domain of electronic administration: at the international level, between developed and developing nations; and at the domestic level, between different social and geographical groups within a single country—a situation that obliges policymakers to attend to the social dimension of digital transformation in order to ensure digital inclusion and prevent the marginalisation of vulnerable groups .

### 3.8 Institutional Theory

Institutional theory, as developed by DiMaggio and Powell (1983) and Scott (2001), provides a valuable theoretical framework for understanding why governments adopt electronic administration or hesitate to do so, independent of purely rational calculations . This theory analyses the institutional pressures that shape adoption decisions and classifies them into three types: coercive pressures (resulting from binding policies and legislation), normative pressures (resulting from professional standards and training), and mimetic pressures (resulting from

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emulating successful models or following what is prevalent and accepted) .

### 3.9 Public Service Dominant Logic (PSL)

Lusch and Vargo (2004) originally introduced the Service Dominant Logic (SDL) in the context of services marketing, but it subsequently found application in electronic administration through Ostrom and colleagues' expansion into Public Service Logic (PSL). This theory affirms that the value of public service is not produced by government alone, but is co-produced with citizens, communities, and partners .

### 3.10 Organisational Transformation and Strategic Change Theory

Some specialists in electronic administration, most notably Heeks (2006), argue that theoretical frameworks borrowed from outside the field of public administration are incapable of encompassing the true complexity of digital transformation processes within governmental bodies. Accordingly, Heeks proposes a Design-Reality Gap Analysis (D-I-F) methodology for analysing the gap between the designed model of electronic administration and the lived institutional reality. This framework has been widely used to diagnose the causes of e-government project failures in developing nations .

Heeks further argues that electronic administration projects may be classified into three types according to the degree of transformation they bring about: systems that freeze existing unsuitable conditions; systems that improve processes without fundamental change; and systems that radically restructure processes, effecting genuine transformation. This classification provides researchers with a valuable instrument for assessing the reality of electronic administration in developing environments such as Algeria.

## Conclusion

Following its review of the three conceptual, developmental, and theoretical trajectories of electronic administration, this article arrives at a number of substantive conclusions:

First — Conceptual Plurality and Interconnectedness: The multiplicity of definitions reveals that electronic administration is a multi-dimensional phenomenon in which technology, organisation, politics, and society intersect. This plurality is not a shortcoming but rather evidence of the richness of the phenomenon and its knowledge ramifications. Nevertheless, a relative consensus emerges across different definitions that electronic administration is, at its core, a transformation in the nature of the relationship between the state and the citizen, mediated by digital technology.

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Second — Rapid and Cumulative Development: The historical phase of the concept's evolution has demonstrated that it is not a transient wave but rather a cumulative, ascending trajectory in which each stage deepens the digital penetration of the state's structure and its relationship with society. The transition from simple automation to the age of artificial intelligence confirms that this trajectory is open-ended, with no defined ceiling.

Third — Theoretical Diversity and Epistemic Complementarity: The field of electronic administration is distinguished by an exceptional theoretical diversity that extends from theories in social psychology (TAM) to theories in political sociology (Institutional Theory), encompassing theories of public administration (NPM) and political economy. This diversity enriches analytical approaches and enables the reading of the phenomenon from multiple perspectives that complement one another.

Fourth — Structural Challenges Facing Electronic Administration: The reviewed theories collectively reveal deep structural challenges confronting electronic administration, chief among them: the digital divide in its multiple dimensions, institutional resistance to change, trust issues, and the difficulty of achieving genuine integration among administrative systems. These challenges are compounded in administrative environments with entrenched bureaucratic traditions, such as the Algerian context.

Fifth — Recommendations: This article recommends that researchers in the field of electronic administration in Algeria transcend descriptive and documentary analyses in favour of applying the reviewed theoretical frameworks to a reading of local reality. Particular emphasis should be placed on: testing technology acceptance models in the Algerian context; deploying Digital Divide Theory to identify loci of digital exclusion; and applying the Design-Reality Gap Analysis (D-I-F) model to evaluate existing electronic administration projects and diagnose the causes of their shortcomings.

In conclusion, electronic administration remains a genuine civilisational challenge for every state that aspires to sound governance and sustainable development. Its success is not contingent upon technical infrastructure alone; it depends, above all, on building trust between the institution and the citizen, developing human competencies, and creating the institutional and legislative environment conducive to embracing this historical transformation.

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