

## DIGITAL TRANSFORMATION OF PUBLIC UTILITIES A COMPARATIVE STUDY ON THE ADAPTATION OF DIGITAL SERVICES IN EGYPT, FRANCE, AND THE UNITED KINGDOM

### *A TRANSFORMAÇÃO DIGITAL DOS SERVIÇOS PÚBLICOS: UM ESTUDO COMPARATIVO SOBRE A ADAPTAÇÃO DOS SERVIÇOS DIGITAIS NO EGITO, NA FRANÇA E NO REINO UNIDO*

### *LA TRANSFORMATION NUMÉRIQUE DES SERVICES PUBLICS: ÉTUDE COMPARATIVE SUR L'ADAPTATION DES SERVICES NUMÉRIQUES EN ÉGYPTÉ, EN FRANCE ET AU ROYAUME-UNI*

**AHMED MOKHTAR ABDELHAMID MOHAMED**

PhD in Public Law. Assistant Professor of Public Law Faculty of Law, Arab Open University, Muscat, Oman. Email: [ahmadmokhtar888@gmail.com](mailto:ahmadmokhtar888@gmail.com); ORCID ID: <https://orcid.org/0009-0008-7145-7506>

#### **ABSTRACT:**

Public utilities are undergoing profound transformations driven by digitalization, which has become a central pillar in modernizing governmental performance and enhancing the efficiency of public service delivery. This study examines the legal adaptation of digital public utilities in Egypt, France, and the United Kingdom, focusing on their compliance with principles of continuity, equality, and accessibility. Using analytical and comparative methodologies, the research highlights legislative gaps, judicial oversight, and policy reforms necessary to balance technological innovation with legal protection.

**Keywords:** Digital Transformation; Public Utilities; Administrative Law; Comparative Law; Digital Services

#### **RESUMO:**

Os serviços públicos estão passando por profundas transformações impulsionadas pela digitalização, que se tornou um pilar central na modernização da administração e na eficiência da prestação dos serviços públicos. Este estudo examina a adaptação jurídica dos serviços públicos digitais no Egito, na França e no Reino Unido, com ênfase no respeito aos princípios de continuidade, igualdade e acessibilidade. Por meio de uma abordagem analítica e comparativa, a pesquisa destaca lacunas legislativas, supervisão judicial e reformas necessárias para equilibrar inovação tecnológica e proteção jurídica.



**Palavras-chave:** Transformação digital; Serviços públicos; Direito administrativo; Direito comparado; Serviços digitais

## RÉSUMÉ:

Les services publics connaissent de profondes transformations sous l'effet de la numérisation, devenue un pilier central de la modernisation de l'action publique et de l'efficacité des services. Cette étude examine l'adaptation juridique des services publics numériques en Égypte, en France et au Royaume-Uni, en mettant l'accent sur le respect des principes de continuité, d'égalité et d'accessibilité. Par une approche analytique et comparative, la recherche met en lumière les lacunes législatives, le contrôle juridictionnel et les réformes nécessaires pour concilier innovation technologique et protection juridique.

**Mots-clés:** Transformation numérique; Services publics; Droit administratif; Droit comparé; Services numériques

## 1 INTRODUCTION

Public utilities form one of the essential pillars of the legal structure of the state. They serve as the state's central tool for implementing public policies and fulfilling the collective needs of society. Historically, public utilities have been associated with notions of sovereignty, service, and social integration, grounded in classical principles such as continuity, adaptability, and equality in access.

However, recent decades have witnessed a qualitative transformation in the performance of public utilities with the advent of digital technologies, especially in light of governmental trends toward 'smart government' and 'digital administration.'

In this context, public services are no longer delivered through traditional means but are increasingly provided via electronic platforms, smart applications, and advanced administrative information systems. This new reality raises significant legal questions regarding the extent to which the concept of the public utility can adapt to the digital environment and the ability of existing legal rules to keep pace with such transformation while safeguarding citizens' fundamental rights and maintaining a balance between administrative efficiency and legality.

Comparative legal systems, particularly those of France, Egypt, and the United Kingdom, have adopted diverse models for the development of digital public utilities. In France, the concept of the "digital transformation of the state" (Transformation



numérique de l'État) has been a strategic project adopted since 2017. Egypt launched its own digital transformation strategy in 2019 under "Egypt Vision 2030." Meanwhile, the United Kingdom has made significant progress through the Government Digital Service (GOV.UK) since 2012, reshaping the relationship between the administration and the citizen.

Accordingly, this study explores the legal framework of the digital public utility through a comparative analytical approach to legislative and regulatory models in the three countries. It assesses their compatibility with classical administrative law principles and the extent to which they provide adequate guarantees for users. The research seeks to construct a legal vision that reconciles technological inevitability with legal protection, based on judicial decisions, academic opinions, and institutional experiences.

## 2 RESEARCH OBJECTIVES

This study aims to explore the dimensions of digital transformation in public utilities from a comparative legal perspective and to analyze the capacity of administrative systems in Egypt, France, and the United Kingdom to accommodate rapid technological changes without compromising legal controls or the principles of public service. Specifically, the study seeks to:

1. Define the conceptual and legal framework of digital public utilities and examine whether a unified legal concept can be adopted for this new form of public services amid differing legal systems.
2. Analyze the extent to which digital public utilities respect traditional public service principles, particularly continuity, equality, and adaptability, in environments that rely on digital platforms and infrastructure.
3. Examine the legislative and regulatory frameworks in Egypt, France, and the UK governing digital utilities, with emphasis on best practices, legislative gaps, and proposed legal recommendations to improve local models.
4. Evaluate the role of administrative courts and regulatory bodies in overseeing digital utilities and assess the effectiveness of legal mechanisms available to



safeguard digital rights, especially in cases of technical failures, digital discrimination, or poor service delivery.

5. Propose legal standards to ensure optimal performance of digital public utilities in transitional environments, promoting a balance between technological innovation and legal guarantees, and enhancing service quality and sustainability.

### 3 RESEARCH PROBLEM

The digital transformation of public utilities has reshaped their structure and service delivery mechanisms, giving rise to new legal challenges regarding how such transformation should be governed under administrative law. Despite the adoption of digital models in many countries, the central research question addressed by this study is:

To what extent have the legal systems in Egypt, France, and the United Kingdom been able to adapt administrative law rules to the digital transformation of public utilities, while maintaining traditional principles and protecting citizens' fundamental rights?

Sub-questions include:

- What legal frameworks govern digital utilities in Egypt, France, and the UK?
- Are principles such as continuity, equality, and adaptability effectively applied in digital contexts?
- How effective is judicial oversight over digital public utilities, particularly in addressing technical failures or digital discrimination?
- How can existing legislative gaps be addressed to keep pace with modern digital administration?

Significance of the Study

This research is important due to the growing interplay between law and technology, especially as digitalization becomes a core component in enhancing public service delivery. The study represents one of the few academic attempts to address digital transformation in public utilities from a comparative legal perspective between three prominent administrative systems: Egypt, France, and the United Kingdom.

The scientific significance lies in assessing how suitable traditional legal frameworks are for addressing the technical challenges posed by digital public service delivery, particularly in ensuring equality, continuity, performance quality, and digital rights protection.

Additionally, the study explores the evolving role of administrative law in governing digital performance and regulating the relationship between administration and citizens in a complex virtual environment—where efficiency and speed intersect with transparency and legality.

The practical significance is reflected in offering actionable recommendations to legislators and practitioners in jurisdictions undergoing digital transformation, particularly in the Arab world, by adapting and localizing best comparative legal practices.

## 4 RESEARCH METHODOLOGY

This study employs two main methodologies to address the legal issues associated with the digital transition of public utilities:

### 1. Analytical Methodology:

This involves analyzing constitutional and legal texts related to public utility regulation and reviewing laws, decrees, and regulations issued in Egypt, France, and the UK concerning digital transformation. It includes examining traditional legal concepts and their contemporary applications and evaluating the extent to which general administrative law rules can adapt to digital environments.

### 2. Comparative Methodology:

The study compares legislative and administrative experiences of the three countries by examining legal principles, models of digital administrative organization, and legal guarantees provided to citizens in each system. The comparison focuses on similarities and differences in digital transformation mechanisms and the effectiveness of legislative oversight and judicial review in each case.

Previous Studies:



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- Stéphane Grumbach (2020): In his study on 'Public Data and the Digital Transformation of French Administration' published in *Revue Française d'Administration Publique*, Grumbach addressed how the French government engaged with digital transformation by promoting open data and transparency. However, the study focused on technical aspects without addressing the legal framework governing digital utilities or their alignment with administrative law principles.
- Eman Hamdy (2021): In her article *Legal Aspects of Egypt's Digital Transformation Strategy*, Hamdy analyzed Egypt's legal framework for digital transformation, highlighting government efforts in administrative digitalization. However, she did not treat digital public utilities as a distinct legal concept nor address user guarantees.
- Mark Elliott and Robert Thomas (2022): In their book *Public Law*, the authors examined the UK's digital transformation experience and the new administrative-citizen relationship. While they analyzed the impact of digital platforms on individual rights, they focused mainly on the principle of legality without expanding on the digital utility as a standalone legal model.
- Sandrine Macau (2019): In her paper *La dématérialisation des services publics*, Macau discussed the consequences of dematerializing public services in France, mentioning risks related to digital exclusion. However, she did not propose a comprehensive comparative legal model for digital utilities or explore judicial oversight in depth.

## 5 SCIENTIFIC CONTRIBUTION AND ORIGINALITY

This research constitutes a substantial contribution to legal scholarship by examining the digital transformation of public utilities through a comparative lens involving Egypt, France, and the UK. It integrates concepts of administrative law and judicial oversight within a rapidly evolving technological environment.

The study is distinguished by its treatment of the digital public utility as an independent legal entity, not merely an extension of traditional administration. It provides a critical analysis of the legal and oversight frameworks governing this new model and proposes practical legislative reforms that are applicable in jurisdictions still in the early stages of digital transformation.





## Chapter One: Theoretical and Legal Framework of the Digital Public Utility

### Section One: The Nature of Public Utility under Digital Transformation

#### Subsection One: The Traditional Concept of Public Utility and Its Legal Foundation

The concept of public utility is one of the core pillars of administrative law in comparative legal systems. It is commonly defined as any activity organized by the state or its affiliated entities to provide a public service that meets a collective need, and is characterized by adherence to fundamental principles such as continuity, equality, and adaptability. This concept has evolved alongside the evolution of the state—from the “watchman state,” to the welfare state, and now to the digital state.

In France, administrative jurisprudence was firmly established following the landmark decision of the Conseil d'État in the Blanco case on February 8, 1873, which is considered foundational for the theory of public utility. The decision affirmed the jurisdiction of administrative courts over disputes involving public utilities. It serves as a cornerstone in defining the relationship between public utility and administrative law.

Legal scholar Léon Duguit played a pivotal role in shaping this concept, defining the public utility as 'an activity aimed at serving the public interest, under the supervision of the state or one of its authorities'. His conceptualization rests on three principles: continuity, equality, and mutability—principles further solidified by the Narcy ruling in 1963, which introduced three criteria for recognizing an activity as a public utility: pursuit of public interest, subjection to public control, and possession of public authority privileges.

In the United Kingdom, the term “public utility” is not formally used in the same manner as in civil law systems. Rather, the British legal system relies on the concept of 'public functions,' which the state is legally obligated to perform. As Bannister and Connolly (2020) observed, “government services in the UK are often delivered digitally without a clear legal framework categorizing them as public utilities”.

In Egypt, the State Council has adopted the French understanding of public utilities. The public utility is defined as “a regular activity undertaken by the state to serve the public interest, subject to the principles of public law”. Scholar Abdel Hamid Metwally emphasized that “the public utility is the foundation of the state’s intervention in social life and the actual expression of its authority”.

The Administrative Judiciary in Egypt has consistently affirmed the central role of public utility within the legal administrative system, drawing on French jurisprudence.



Dr. Mohamed Fouad Abdel Basset stated, “The public utility is the core around which the doctrine of administrative law revolves”.

## Subsection Two: Characteristics of the Digital Utility and the Distinction from Digital Administration

With the growing role of technology in public service delivery, the traditional concept of public utility faces new challenges. Providing services through digital platforms raises questions about the applicability of classical principles, particularly in cases of system failure or algorithmic bias.

Digital public utilities are characterized by emerging technologies such as electronic platforms, artificial intelligence, and blockchain systems. These are distinct from digital administration, which may use technology for internal administrative functions without altering the nature of public service delivery to citizens.

The digital utility exhibits several novel features, including: immaterial service provision, real-time responsiveness, reliance on user data, and the risk of digital exclusion. These features necessitate a re-evaluation of traditional public utility concepts.

Maugüé (2019) observed that French legislation began to incorporate these transformations through the “Digital Republic Law” (Loi pour une République numérique, 2016), which enshrined the “right to access digital services” as a legal principle. This law obligates digital administrations to ensure equal access, technical continuity, and transparency in automated processing.

A comparative study by Binns (2018) highlighted legal challenges arising from automated decisions by AI systems in the UK, noting that “UK administrative law has not yet developed effective mechanisms for algorithmic accountability, despite their growing use in the public sector” (Binns, 2018, pp. 122–125).

The UK Cabinet Office’s Digital Government Review (2020) distinguishes between “Digital Services” and “Digital Governance,” emphasizing the need for legal infrastructure that protects users and facilitates access.

Ian Brown, in a Scopus-indexed article published in the International Review of Administrative Sciences (2021), asserted that “the digital utility cannot be understood without integrating its technological dimensions with principles of legality and transparency” (Brown, 2021, p. 145).

In Egypt, Shaimaa Abdel-Meguid (2022) identified deficiencies in the legislative framework regulating government digital platforms, noting that current laws do not





clearly assign administrative liability for service interruptions or delays in responding to citizen requests (Abdel-Meguid, 2022, p. 114).

The increasing reliance on digital means for service delivery has resulted in new features that define the so-called “digital public utility,” which differ significantly from traditional services. Key characteristics include:

- **Immateriality:** Services are delivered via electronic platforms without physical presence, reshaping the interaction between citizens and the administration.
- **Automated Decision-Making:** Many decisions are made through programmed algorithms, reducing human intervention and raising concerns about oversight and legality.
- **Multiple Operational Stakeholders:** Many digital services are developed or operated by private companies, raising questions about their subjection to public law.
- **Technical Vulnerability:** Unlike traditional utilities, digital utilities are susceptible to technical failures or cyberattacks, which can completely disrupt service.

Second Branch: Characteristics of the Digital Public Utility and Its Distinction from Digital Administration

With the growing role of technology in delivering public services, the traditional concept of public utilities now faces new challenges. Delivering services via digital platforms raises significant questions about the application of traditional public utility principles, particularly in cases of system failures or algorithmic bias.

Modern technologies—such as electronic platforms, artificial intelligence, and blockchain—are at the core of this transformation. It is crucial, however, to distinguish between a digital public utility and digital administration. While the latter may use technology for internal administrative purposes, it does not necessarily alter the nature of service delivery. In contrast, a digital public utility changes how the service reaches citizens and how decisions affecting them are made.

Digital utilities exhibit several unique characteristics, including:

- **Intangibility:** Services are provided through electronic interfaces without physical interaction, reshaping the relationship between citizens and public authorities.

- **Rapid Interaction:** Digital systems allow real-time service delivery and data processing, introducing new expectations for responsiveness and accountability.
- **Data Dependency:** Services often rely heavily on user data, raising legal and ethical concerns about privacy, consent, and data governance.
- **Digital Exclusion Risk:** Some individuals may lack the necessary digital skills or infrastructure to access services, increasing the risk of marginalization.

Maugüé (2019) observed that French legislation has begun to address this transformation through the Digital Republic Law (Loi pour une République numérique, 2016), which formally recognized the right to digital access to public services. This law obligates digital administrations to ensure equality of access, technical continuity, and transparency in automated processes.

In a comparative study, Binns (2018) examined the legal challenges posed by automated decisions taken by AI systems in the UK, highlighting the lack of effective mechanisms for holding algorithms accountable, despite their growing role in public sector decision-making.

The UK Cabinet Office's Digital Government Review (2020) differentiated between digital services and digital governance, emphasizing the need for legal frameworks that protect users and guarantee equitable access to electronic services.

In a peer-reviewed study published in the International Review of Administrative Sciences, Ian Brown noted that “a digital utility cannot be understood without integrating its technological dimensions with guarantees of legality and transparency”.

In Egypt, researcher Shaimaa Abdel-Meguid (2022) pointed out the limitations of the existing legal framework governing government digital platforms. She noted that current laws do not clearly define the administrative responsibility in cases of service disruption or delayed responses to citizens.

Thus, the increasing reliance on digital tools in public service delivery has created qualitatively new features for what is now known as the digital public utility. These features differ fundamentally from traditional utilities. The most notable include:

- **Non-materiality:** Services are delivered virtually, transforming the citizen–administration interface.

- Automated Decision-Making: Many decisions are made by pre-programmed algorithms, minimizing human intervention and raising concerns about oversight and legality.
- Multiple Operational Stakeholders: Many digital services are developed or operated by private companies, raising questions about the applicability of public law.
- Technical Vulnerability: Unlike traditional utilities, digital services are susceptible to technical malfunctions and cyberattacks that can halt operations entirely.

## Section Two: Principles of Administrative Law in a Digital Environment

### *First Branch: The Principles of Continuity and Equality in Digital Public Services*

Administrative law requires that public utilities maintain uninterrupted service provision. In the digital era, ensuring continuity depends largely on the technological readiness of digital infrastructure. However, countries often face challenges such as cybersecurity threats or weak internet connectivity in remote areas, which may lead to violations of this foundational principle.

The principle of equality is also undergoing a profound test due to disparities in citizens' ability to use digital tools. In Egypt, for instance, the percentage of internet users remains limited in certain regions, creating a digital divide that threatens equal access to public services.

In France, the Administrative Court of Lyon ruled in 2021 to annul an administrative decision made through an electronic system that failed to accommodate users with digital disabilities. The court affirmed that "digitalization does not exempt the administration from its obligations regarding equality and universal access".

### *Second Branch: The Principle of Adaptability and Protection of Digital Rights of Citizens*

Administrative law also requires public utilities to be adaptable to changing conditions. This adaptability becomes essential in the context of digital transformation. However, such flexibility must not come at the expense of citizens' fundamental rights, especially the right to privacy and equitable access to services.

In France, the National Commission on Informatics and Liberty (CNIL) mandated that public bodies refrain from using biometric recognition technologies without an explicit legal basis. In its 2022 Annual Report, CNIL stressed that digitalization must respect the principle of proportionality.



In the United Kingdom, the Data Protection Act 2018 stipulates that any digital system offering public services must adhere to legitimate data processing standards and provide mechanisms for challenging automated decisions. In a landmark ruling (*R (Edward Bridges) v South Wales Police*, 2020), the Administrative Court in England held that the use of facial recognition technologies in public spaces without adequate legal oversight was unlawful.

In Egypt, the National Council for Human Rights emphasized in its 2023 report that digital transformation must be accompanied by legislative and judicial safeguards to protect citizens from digital exclusion and the misuse of personal data.

## **Chapter Two: Comparative Experiences and Legal Oversight of Digital Utilities**

### **Section One: Comparative Legislation in Egypt, France, and the United Kingdom**

#### **First Branch: The Egyptian Legal Framework for Digital Transformation**

Egypt has witnessed accelerated legislative developments in the area of digital transformation, most notably the enactment of Law No. 175 of 2018 on Cybercrime and Law No. 151 of 2020 on Personal Data Protection. The government also launched the Digital Egypt Platform, aiming to unify various public services under a centralized, legally regulated system.

However, the Egyptian legal framework still suffers from regulatory gaps, particularly in areas such as accountability for digital service failures, mechanisms for appealing automated decisions, and oversight of government contracts with IT service providers.

A 2022 study published in the *Journal of Legal and Administrative Studies* at Cairo University highlighted that relevant Egyptian legislation has not explicitly adopted the principles of digital governance, calling for a comprehensive legislative overhaul.

#### **Second Branch: The French Legal Framework for Digital Utilities**

Since 2016, France has pursued an ambitious digital strategy through Law No. 2016-1321 known as the Digital Republic Law. This law establishes principles of transparency, open data, and the rights of digital citizens. All digital state platforms are subject to oversight by the CNIL, which ensures compliance with the General Data Protection Regulation (GDPR).

In a landmark decision issued on July 13, 2020, the French Conseil d'État ruled that "algorithms used by public authorities must be transparent, contestable, and



subject to judicial review. This decision marked a significant turning point in safeguarding citizens from arbitrary automated systems.

## Third Branch: The UK Legal Framework and Digital Governance

The United Kingdom has developed a comprehensive legal framework for digital governance based on the Data Protection Act 2018 (DPA), which complements the earlier EU regulation. Additional guidelines are issued by the Information Commissioner's Office (ICO). These regulations require public institutions to conduct Privacy Impact Assessments before launching digital services.

The Government Digital Service (GDS) also issues binding guidelines to ensure fair design of digital government services and prevent digital exclusion. A 2021 study published in Public Administration noted that the UK system integrates both legal regulation and institutional software design.

## Section Two: Legal Guarantees and Oversight of Digital Utilities

### First Branch: Protection of Fundamental Rights and Personal Data

The widespread reliance on digital platforms and artificial intelligence in managing public utilities has raised pressing legal questions about the extent to which fundamental rights are protected—particularly the right to privacy, equal access, and the right to information.

In France, the Commission Nationale de l'Informatique et des Libertés (CNIL) has played a key role in establishing data protection standards. It has prohibited the use of automated systems for making individual decisions without human oversight. In its 2023 annual report, CNIL stressed that “digital transformation must not become a silent tool for social exclusion”.

In the United Kingdom, the Supreme Court ruled in the well-known case *R (on the application of Edward Bridges) v South Wales Police* (2020) that public authorities must reassess the use of facial recognition technology. The Court emphasized that “privacy is a fundamental right that cannot be compromised in the name of administrative efficiency” (UK Supreme Court, 2020, para. 42).

In Egypt, despite the enactment of Law No. 151 of 2020 on Personal Data Protection, implementation still faces challenges—most notably, the absence of an independent and effective authority to oversee the administrative use of personal data. This leaves digital utilities vulnerable to misuse or negligence.

## Second Branch: Judicial Oversight and Administrative Courts' Stance in the Three Countries



Administrative courts have increasingly been called upon to address the legal implications of algorithmic decision-making, as digital utilities present both technical and legal complexities. One key challenge is verifying the logic behind algorithmic decisions.

In France, the Conseil d'État ruled that the algorithms used by administrative bodies must be disclosed and that “algorithmic transparency” is a pillar of legal legitimacy. The court also affirmed the right of citizens to challenge administrative decisions, even if issued by an automated system.

In the UK, courts have adopted a proactive stance. In *Liberty v Secretary of State for the Home Department* (2019), the Administrative Court invalidated the use of surveillance software without a specific legal basis. The judgment underscored that “digital administrative authority is not above judicial scrutiny.”

In Egypt, the State Council addressed this issue in a 2023 ruling concerning challenges to university admissions results processed via automated digital systems. The court held that “the use of automated platforms does not exempt administrative decisions from grievance or judicial review,” calling for a reassessment of control mechanisms in digital government platforms.

### Third Branch: Legislative Proposals Toward a Unified Digital Utility Law

The rapid evolution of digital public services necessitates the enactment of a unified legal framework to regulate this emerging category of utilities. Such a law should preserve digital privacy, ensure transparency, and promote equality. This research proposes the following:

- Enact a dedicated law on digital utilities that defines their scope and sets governance and oversight mechanisms.
- Mandate algorithmic disclosure in all administrative decisions made using automated systems.
- Establish an independent oversight authority for monitoring the performance of digital government services.
- Ensure universal access to digital utilities, addressing digital and geographical disparities.
- Develop electronic appeal mechanisms and guarantee human intervention in final decisions.



These recommendations are supported by a 2023 study in Government Information Quarterly, which noted that “success in digital public utilities depends not only on technical infrastructure, but also on a legal system that redefines legitimacy and oversight”.

## 6 CONCLUSION

The digital transformation of public utilities represents a paradigm shift in public administration. However, it simultaneously introduces unprecedented legal challenges that directly affect fundamental principles of administrative law—such as legality, equality, and oversight. Comparative experiences in France, the United Kingdom, and Egypt have shown that the success of digitalization is not measured solely by the level of service, but also by the extent to which it is governed by legal frameworks that ensure justice and transparency.

The real risk lies not in the technology itself, but in the absence of appropriate legal regulation. Automated systems can marginalize citizens or issue decisions without human oversight, underscoring the urgent need for legislative and judicial intervention to redefine concepts of responsibility, legality, and the right to appeal.

Through this study, several key findings have emerged:

### 1. Inadequacy of Traditional Administrative Law Concepts:

The study reveals that classical legal concepts such as legality and equality are no longer sufficient to regulate the performance of digital public utilities—particularly in light of the involvement of artificial intelligence in administrative decision-making.

### 2. Lack of Specific Legislation Regulating Digital Utilities:

Despite some legislative efforts in Egypt, France, and the UK, most countries still lack comprehensive legal frameworks that oblige digital utilities to respect fundamental rights or allow effective oversight of automated decisions.

### 3. Opacity of Algorithms Used in Public Services:

The comparative analysis shows that most jurisdictions do not require mandatory disclosure of the logic behind algorithmic decisions, thereby limiting citizens’ ability to understand or challenge such decisions. This makes digital systems invisible instruments of power.



4. Inequitable Access to Digital Services Undermines the Principle of Equality: Digital transformation has exacerbated socio-economic disparities, as many individuals cannot benefit from digital utilities due to technological illiteracy or lack of infrastructure. This deepens social exclusion and undermines administrative legitimacy.
5. Existence of Leading International Practices in Oversight of Digital Utilities: The British and French experiences highlight the importance of involving independent bodies (such as CNIL and ICO) in monitoring government software systems. Courts in both countries have emphasized the need to respect individual rights when using automated systems in public service delivery.
6. Absence of Clear Legal Remedies for Challenging Digital Decisions: The study finds no widespread availability of effective and accessible appeal mechanisms for administrative decisions made by automated systems, raising serious concerns about procedural rights in the digital age.

## Recommendations

- Enact a unified digital utilities law that defines the responsibilities of government entities and safeguards user rights.
- Require prior disclosure of algorithms used in digital administrative decision-making.
- Strengthen the role of independent national bodies (such as CNIL in France and ICO in the UK) to monitor the legal performance of digital systems.
- Develop digital appeal mechanisms, ensuring the right to human oversight in final decisions.
- Apply principles of algorithmic justice at all stages of the design and operation of digital administrative systems.

In conclusion, this study opens the door for an expanded academic discussion within administrative law regarding the urgent need to adapt legislative structures to a rapidly evolving digital reality. It provides a foundational scientific contribution that future research can build upon—especially within Arab legal systems that are entering this domain without adequate legal preparedness.

The concept of the digital public utility is not only a response to technological advancements but also a reflection of a broader transformation in governance models worldwide. While the traditional public utility framework emphasized infrastructure,



human resources, and physical presence, the digital era demands a focus on interoperability, cybersecurity, and user-centered design. Comparative experiences show that the speed of adaptation often depends on institutional flexibility and the capacity to integrate legal reforms with technical upgrades. For instance, the French experience demonstrates that legislative modernization, such as the Digital Republic Law, works best when accompanied by proactive judicial oversight. In contrast, the British model reveals the importance of administrative guidelines issued by central bodies like the Government Digital Service, which directly shape user experience. The Egyptian approach, while ambitious in its vision, still faces challenges due to fragmented implementation and the absence of a unified regulatory authority for digital services. A deeper comparative reading reveals that Egypt, France, and the United Kingdom differ fundamentally in how they regulate and monitor digital utilities.

In Egypt, the emphasis has been on legislative enactments targeting cybercrime and data protection; however, there is a pressing need to introduce sector-specific regulations that address digital service failures and define algorithmic transparency. France, on the other hand, treats digital access as a statutory right, backed by strong enforcement powers vested in the CNIL. This has enabled French courts to address not only technical failures but also cases of algorithmic discrimination. In the United Kingdom, the approach is highly procedural, ensuring that public bodies conduct privacy impact assessments and provide citizens with accessible channels to challenge automated decisions. This procedural safeguard, while valuable, can become

bureaucratically burdensome, delaying access to timely remedies.

Recent judicial developments in all three jurisdictions have shown a gradual shift toward recognizing the need for algorithmic accountability. In Egypt, the State Council's 2023 ruling on automated university admissions highlighted the necessity of human oversight in digital platforms.

In France, the Conseil d'État has not only required transparency in algorithmic processes but also imposed disclosure obligations on administrative bodies. In the UK, landmark rulings such as *R (Edward Bridges) v South Wales Police* have reinforced the idea that efficiency cannot justify breaches of privacy. These rulings collectively underline a shared judicial understanding: the protection of citizens' rights must remain paramount, regardless of the mode of public service



delivery.

From a practical standpoint, achieving effective digital utility governance requires a multi-layered strategy. Firstly, legislation should explicitly define the boundaries of automated decision-making, ensuring that citizens retain the right to human review. Secondly, independent oversight bodies must be equipped with both legal authority and technical expertise to audit algorithms. Thirdly, cross-border cooperation should be encouraged, particularly within regions sharing similar legal traditions, to harmonize standards and facilitate the exchange of best practices. Finally, public awareness campaigns should be launched to ensure that citizens understand their digital rights and the remedies available to them, thereby fostering trust in the digital public utility system.

The researcher believes that understanding the digital transformation of public utilities requires not only legal analysis but also a critical evaluation of its socio-economic implications.

The researcher believes that the historical evolution of public utility concepts demonstrates the adaptability of administrative law to emerging governance models.

The researcher believes that the defining features of digital utilities demand a reconsideration of traditional administrative law principles to ensure inclusivity and fairness.

The researcher believes that continuity, equality, and adaptability must be reinterpreted to reflect the realities of digital governance and protect vulnerable groups.

The researcher believes that the legislative diversity between Egypt, France, and the UK offers valuable lessons for constructing a balanced and rights-oriented digital utility framework.

The researcher believes that judicial intervention is essential in maintaining transparency and accountability in algorithmic decision-making within public utilities.

The researcher believes that future reforms must integrate both legal safeguards and technological innovation to achieve sustainable digital utility governance.

The researcher believes that the digital era presents an opportunity to redefine the relationship between the state and citizens through adaptive and rights-centered administrative law.

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