

SMART ADMINISTRATIVE CONTRACTS: TOWARDS A LEGAL FRAMEWORK FOR THE USE OF DIGITAL CONTRACTS IN GOVERNMENT PROCUREMENT A COMPARATIVE STUDY: EGYPT, FRANCE, AND THE UNITED ARAB EMIRATES

CONTRATOS ADMINISTRATIVOS INTELIGENTES: RUMO A UM MARCO LEGAL PARA O USO DE CONTRATOS DIGITAIS EM COMPRAS GOVERNAMENTAIS UM ESTUDO COMPARATIVO: EGITO, FRANÇA E EMIRADOS ÁRABES UNIDOS

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ABSTRACT

The world is witnessing a rapid shift towards digitization in the management of public utilities. One of the most significant manifestations of this transformation is the adoption of smart administrative contracts in the field of government procurement. This research aims to examine the legal framework governing the use of smart contracts in administrative agreements and to analyze the legal challenges they pose in terms of form, execution, oversight, and ensuring transparency. This study adopts a comparative methodology focusing on the legal systems of Egypt, the United Arab Emirates, and France. The aim is to highlight points of convergence and divergence, and to draw applicable models for Arab countries. The research relies on an analytical approach to legal texts, administrative court rulings, and scholarly opinions, proposing a foundational legal framework for the use of smart contracts that respects national legal specificities and is grounded in the principles of legality, efficiency, and the protection of public funds.

Keywords: Digitalization; Smart contracts; Government procurement; Legal challenges; Transparency.

RESUMO

O mundo está testemunhando uma rápida mudança em direção à digitalização na gestão de serviços públicos. Uma das manifestações mais significativas dessa transformação é a adoção de contratos administrativos inteligentes no campo das compras governamentais. Esta pesquisa tem como objetivo examinar a estrutura legal que rege o uso de contratos inteligentes em contratos administrativos e analisar os



desafios legais que eles representam em termos de forma, execução, supervisão e garantia de transparência. Este estudo adota uma metodologia comparativa com foco nos sistemas jurídicos do Egito, Emirados Árabes Unidos e França. O objetivo é destacar pontos de convergência e divergência e traçar modelos aplicáveis para os países árabes. A pesquisa se baseia em uma abordagem analítica de textos jurídicos, decisões judiciais administrativas e pareceres acadêmicos, propondo um marco legal fundamental para o uso de contratos inteligentes que respeite as especificidades legais nacionais e esteja fundamentado nos princípios de legalidade, eficiência e proteção de fundos públicos.

Palavras-chaves: Digitalização; Contratos inteligentes; Compras governamentais; Desafios legais; Transparência.

1 INTRODUCTION

In recent years, administrative contracts have undergone radical transformations due to the digital revolution. These contracts are no longer limited to paper-based models and traditional procedures but have begun to adopt advanced technological solutions known as 'smart contracts'. A smart contract refers to an agreement that is concluded and executed autonomously using blockchain technology, ensuring fast performance, accurate implementation, and minimal human intervention.

In this context, government procurement emerges as one of the most prominent fields for the application of smart contracts due to its significant financial burden on public budgets and the legal requirements it entails in terms of transparency, oversight, and safeguards. However, this digital transformation raises fundamental questions about the suitability of traditional legal frameworks governing administrative contracts to accommodate such technology, especially given the novel characteristics associated with form, medium, and automated execution.

This study seeks to analyze the legal framework governing the use of smart administrative contracts in government procurement through a comparative analysis of three legal systems that reflect diverse experiences in legal structure and digital transformation: Egypt, the United Arab Emirates, and France. France represents a leading civil law model in Europe, while the UAE serves as a pioneering Arab model in digital governance, and Egypt illustrates a gradually evolving legal framework toward digitalization.

The study is based on the analysis of national legal texts, administrative court rulings, and legal scholarship to assess the extent to which current legislation accommodates smart contracts. It identifies strengths and deficiencies and proposes



legal solutions to ensure the safe and effective use of such contracts without compromising the principles of legality, equality, and transparency that govern public procurement.

2 RESEARCH OBJECTIVES

This research aims to analyze the legal framework regulating the use of smart contracts in the field of government procurement, in light of the challenges posed by rapid digital transformations to traditional public sector contracting models. With the emergence of smart administrative contracts, it has become imperative to examine the compatibility of this new technology with the core principles of administrative contracts, including transparency, equality among bidders, and public interest.

Additionally, the research assesses the readiness of national legislation in Egypt, the UAE, and France to integrate such digital contract models, in terms of both legislative structure and relevant administrative and judicial practices. Through comparative analysis, the study highlights areas of divergence and convergence between these legal experiences and identifies legal patterns that can inform the development of Arab legislative systems.

Beyond theoretical exploration, the research seeks to propose a balanced legal framework for the adoption of smart administrative contracts that preserves administrative efficiency while safeguarding the traditional guarantees afforded to contracting parties. The study also aims to support practitioners in government agencies by offering a realistic analysis of practical challenges and presenting actionable legal recommendations, thereby providing a practical reference for reforming the public procurement system.

3 RESEARCH PROBLEM

The integration of smart contracts into government procurement processes raises a series of complex legal questions, particularly in the absence of clear legislative provisions regulating such contracts in most Arab legal systems. Classical administrative contracts, as established in jurisprudence and judicial decisions, rely on



traditional legal concepts relating to the form of the contract, its parties, and the mechanisms of oversight. These do not align seamlessly with the technical nature of smart contracts. The core legal issue addressed by this study is the extent to which the existing legal frameworks in Egypt, the UAE, and France are capable of accommodating digital transformations in the management of administrative contracts, particularly smart contracts, without undermining the constitutional and administrative controls that govern public funds.

This issue is further complicated by the differences between these legal systems in their legislative and institutional adaptation to digital models. Therefore, the central research question is: To what extent do national laws in Egypt, the UAE, and France allow for the adoption of smart administrative contracts in government procurement? What are the legal and regulatory challenges posed by such contracts in terms of organization, execution, oversight, and safeguards?

This general problem leads to the following sub-questions:

- What is the conceptual and technical framework of smart contracts, and how do they differ from traditional administrative contracts?
- Are current legal rules sufficient to provide adequate legal protection in cases of breach or disputes involving smart contracts?
- How capable is the administrative judiciary of dealing with new digital contract formats, particularly regarding their proof and enforcement?
- Are there successful legislative or regulatory practices in France or the UAE that can be applied to improve the Egyptian model?
- What is the proposed legal model for regulating the use of smart contracts in government procurement in a way that ensures efficiency and preserves legality?

4 SIGNIFICANCE OF THE STUDY

This study derives its importance from the convergence of two dimensions: the technical dimension represented by the rapid digital transformation in public administration, and the legal dimension that necessitates a reassessment of the traditional framework governing administrative contracts. Smart administrative contracts are no longer a theoretical option but have become an applied reality in



several countries, necessitating a serious and accurate examination of their legal implications.

The study is significant for its novel subject matter, as smart contracts in government procurement have not yet received comprehensive legal analysis, especially within the Arab context, despite the pressing challenges they pose in terms of form, jurisdiction, implementation, and oversight. The research also aligns with the broader objective of modernizing public administration and developing tools for transparency and good governance—priorities for many Arab countries, including Egypt and the UAE.

Furthermore, the comparative methodology employed in this study allows for a nuanced understanding of the strengths and weaknesses in the legal systems under review and provides a means for drawing on the most effective models. The French model offers advanced legislative experience in digital transactions, while the UAE represents a leading applied environment in smart government, and Egypt is at a transitional stage requiring balanced solutions that combine digitization with legal safeguards.

The practical value of the study lies in its policy-oriented recommendations aimed at legally framing the use of smart contracts in government procurement, enhancing public spending efficiency, limiting corruption, and preserving the legal rights of both administrative bodies and their contractors.

5 RESEARCH METHODOLOGY

This research employs a comparative and analytical legal methodology to examine smart administrative contracts as a newly emerging legal phenomenon that intersects technical, administrative, and legislative domains. The methodological tools used are as follows:

- Analytical Method: This involves examining legal and regulatory texts related to the use of smart contracts in Egypt, the UAE, and France, analyzing their content, areas of application, limitations, and legal gaps. It also covers administrative court rulings, particularly those dealing with the legality, enforcement, and dispute resolution aspects of digital contracts.



- **Comparative Method:** This forms the core of the research and is used to compare the legal experiences of the three selected countries to explore commonalities and differences in the regulation and application of smart contracts in government procurement. It accounts for the legal specificities of each system, their digital maturity, and the role of executive and judicial branches in regulating digital contracting.

- **Applied Realistic Method:** The study relies on governmental reports, digital transformation plans, and actual administrative practices in the studied countries to assess the real-world implementation of smart contracts and identify the legal and regulatory challenges faced by public institutions in their use.

The research also draws upon Arab and foreign legal scholarship, peer-reviewed articles, and official documents to construct a coherent and applicable legal framework that reflects current legislative and judicial practices in this innovative and impactful area.

6 RESEARCH HYPOTHESES

This study is guided by several scientific hypotheses that direct the process of analysis and comparison, aiming to test their validity against legal texts and judicial and administrative practices in the selected countries. The primary hypotheses are as follows:

1. The traditional legal framework governing administrative contracts in most national systems, including Egypt, is no longer sufficient to regulate smart contracts due to their unique technical characteristics that fall outside the formal and procedural constraints of classical administrative contracts—particularly concerning consent, proof, and execution.

2. Advanced legislation in digital transformation, such as that of the UAE and France, provides models that can be utilized to develop smart contract regulations in countries with more traditional legislative structures, provided these models are adapted to fit national specificities.

3. Smart contracts, if properly regulated, can achieve greater efficiency in the execution of public procurement by reducing manual procedures, ensuring automatic fulfillment of contractual obligations, and limiting opportunities for manipulation and administrative corruption.

4. Administrative judiciaries in the comparative jurisdictions still face difficulties in dealing with disputes arising from smart contracts, particularly regarding their legal recognition, proof mechanisms, and oversight processes.

These hypotheses are subjected to rigorous testing through comparative legal analysis and realistic evaluation of legislative experiences and judicial and administrative practices, in order to derive scientific findings that support the development of an effective and applicable Arab legal model.

7 LITERATURE REVIEW

Although the topic of smart administrative contracts is relatively new, academic interest in it has increased in recent years across both Arab and comparative legal literature due to governments' increasing reliance on digital transformation tools. Previous studies may be categorized into three main groups:

First: Comparative Foreign Studies

Several European studies have addressed smart contracts in the public sector. One notable example is 'Smart Contracts in Public Procurement: Legal Framework and Challenges' (Bruno Deffains, 2021), which analyzes the technical and legal challenges of integrating smart contracts into the EU public procurement system, with a particular focus on French law. The study concluded that significant structural legal amendments are required to accommodate automated contract execution in a blockchain environment.

Another study published in *Revue du Droit Public* (2022) explores the legality of digital contracts in French administrative law, linking transparency to cybersecurity requirements, and calling for explicit legislative intervention to assign smart contracts a distinct legal status.



Second: Arab Studies

Arabic-language studies remain limited. A notable example is a 2023 study published in the 'Law and Economics Journal' at Cairo University entitled 'The Potential of Smart Contracts in Developing Egypt's Public Procurement System', which focused mainly on the technical side of smart contracts without in-depth legal classification or judicial challenges. It also lacked a comparative context or analysis of the UAE's experience.

Another example is a 2022 study published in Dubai's 'Law and Administration Journal' titled 'UAE Legislation and Digital Transformation in Government Contracts', which reviewed the UAE's smart government initiatives but did not explore the compatibility of its legal framework with the precise definition of smart contracts.

Third: Government Reports and Practical Practices

A 2020 report by the French Ministry of Finance on 'Digitization of Public Procurement' referenced early indications of smart contract use but stopped short of recommending their formal regulation. In the UAE, Dubai Digital Authority released a comprehensive digital policy document in 2021 referencing smart contracts as a future tool and recommending corresponding legislative updates.

Critical Evaluation:

A review of these studies reveals that most focus on technical aspects or partial applications, without offering a comprehensive legal analysis combining comparative jurisprudence, legislative review, and judicial interpretation. There is a clear gap in studies addressing the integration of smart contracts into the administrative contracts framework, especially in terms of enforcement, oversight, and compliance with principles of legality and transparency.

This research aims to fill this gap by providing a comprehensive legal treatment based on comparisons among three distinct legal systems and proposing an applied doctrinal model for the use of smart contracts in public procurement.

8 SCIENTIFIC CONTRIBUTION AND ORIGINALITY

The scientific contribution of this research lies in its treatment of a modern legal subject that has not yet received sufficient attention in Arab legal scholarship: smart administrative contracts within the context of government procurement, approached



through comparative and analytical lenses. While many previous studies have examined smart contracts within the framework of commercial transactions or private agreements, this research focuses on their place within administrative contracts, which are governed by principles of legality, public oversight, and public interest.

The originality of the study is reflected in its multi-level analysis:

- **Conceptual Level:** The research offers a rigorous legal definition of smart contracts and compares them to traditional administrative contracts, highlighting points of convergence and conflict and examining how digital tools may be adapted within administrative legal frameworks.

- **Comparative Legislative Level:** It contrasts the Egyptian experience—currently undergoing gradual digital transformation—with the advanced digital governance model of the UAE and the French civil law tradition, which incorporates legal innovation in public services.

- **Applied Level:** The study is grounded in real-world administrative procurement practices and relies on official documents, court rulings, and doctrinal analysis to assess the feasibility of applying smart contracts within the confines of existing legal safeguards. It proposes a structured legal model for regulating their use.

By doing so, the research fills a clear scholarly gap in Arab administrative law literature and provides a methodological reference that can be utilized in future academic work and legislative reform efforts, especially as Arab governments continue to expand the use of digital technologies and blockchain in administrative processes.

9 RESEARCH STRUCTURE

This research is structured into two main chapters, each of which addresses a critical dimension of smart administrative contracts. The first chapter explores the theoretical and legislative foundations of such contracts, while the second chapter examines the legal and regulatory challenges surrounding their application in government procurement. The research is organized as follows:

Chapter One: The Conceptual and Legislative Framework of Smart



Administrative Contracts

Section One: The Legal and Technical Concept of Smart Contracts

- Subsection 1: Definition and Distinction from Traditional and Electronic Contracts

- Subsection 2: Technical and Legal Features in the Administrative Environment

- Subsection 3: The Possibility of Classifying Smart Contracts as Administrative Contracts

Section Two: Legal Regulation of Smart Contracts in Public Procurement

- Subsection 1: The Egyptian Legislative Experience and Digital Activation Limits

- Subsection 2: The UAE Experience Between Smart Environment and Legal Regulation

- Subsection 3: The French Experience in Integrating Smart Contracts into Public Procurement

Chapter Two: Legal and Regulatory Challenges of Smart Administrative Contracts

Section One: Legal Challenges in Administrative Law

- Subsection 1: The Availability of the Elements of Administrative Contracts in the Smart Model

- Subsection 2: Administrative Liability for Breach and Remedies

- Subsection 3: Evidentiary Value of Smart Contracts Before the Administrative Judiciary

Section Two: Oversight of Smart Contracts in Government Procurement

- Subsection 1: Limits of Administrative and Financial Oversight in the Digital Environment

- Subsection 2: Role of Audit and Control Bodies in Verifying Proper Execution

- Subsection 3: Judicial Oversight Mechanisms and Protection of Public Funds

The research concludes with a general conclusion summarizing key findings, legal recommendations, and a proposed Arab legal model for regulating smart administrative contracts.

Chapter One: The Conceptual and Legislative Framework of Smart Administrative Contracts

Section 1: The Legal and Technical Concept of Smart Contracts



9.1 DEFINITION AND DISTINCTION FROM TRADITIONAL AND ELECTRONIC CONTRACTS

A smart contract is a computer program stored on blockchain technology, designed to automatically execute the terms agreed upon between the parties without the need for human intervention once predetermined conditions are met. These contracts are characterized by autonomous execution and independence from third-party oversight, offering a novel technical dynamic within legal environments.

Nick Szabo, who first conceptualized the term in 1994, described it as “a protocol with digital rules that executes automatically via programmed code, without intervention from the parties after activation” (Szabo, 1997).

In French legal scholarship, a smart contract is defined as: “Un mécanisme contractuel automatisé, inscrit sur une blockchain, permettant l’exécution des obligations contractuelles sans intervention humaine” (see: M. Mekki, Les contrats à l’épreuve du numérique, Dalloz, 2021, p. 245).

In the Arab legal context, the absence of a legislative definition has led scholars to describe it as: “An agreement written in programmed digital form, executed automatically without direct administrative review, and implemented via technically secured electronic platforms.” (see: Dr. Abdullah Arafa, Legal Characterization of Smart Contracts, Cairo University Law Journal, 2022, p. 171).

9.2 TECHNICAL AND LEGAL FEATURES IN THE ADMINISTRATIVE ENVIRONMENT

Smart contracts possess distinctive technical features that set them apart from traditional and electronic contracts:

- Automated Execution: Obligations are fulfilled automatically when preset conditions are met via programmed code stored on a blockchain network. This challenges traditional contract doctrines such as force majeure or exceptional circumstances, which require human intervention. The Egyptian Supreme

Administrative Court stated: "Administrative authorities may amend a contract where necessary for public service" (Case 2666/49S.A.C., 19 May 2007).

- Decentralization and Transparency: These contracts are stored in distributed databases resistant to tampering, enhancing transparency and limiting administrative corruption. Dubai Digital Authority reported in 2021 that adopting smart contracts reduced procurement timelines by 60%.

- Security and Self-Authentication: Smart contracts do not require traditional signatures, relying instead on encrypted blockchain validation, raising questions about admissibility in administrative courts.

Legally, smart contracts in government procurement present challenges:

- Absence of Negotiation: Traditional administrative contracts allow flexibility; smart contracts are pre-coded and executed literally, limiting administrative discretion.

- Legal Recognition: Most legislations, including Egypt's Public Procurement Law No. 182 of 2018, do not explicitly recognize smart contracts;

- Evidentiary Challenges: The complexity of code-based contracts poses interpretive difficulties for judges, as highlighted by French scholar Jean-Baptiste Racine: "Le juge administratif est encore peu préparé à interpréter des codes informatiques comme des clauses contractuelles" (Racine, La justice administrative et la révolution numérique, RFDA, 2022, p. 93);

- Judicial Oversight: In dual judicial systems like Egypt and France, administrative courts play a key role in overseeing public contracts. However, full execution before judicial review limits oversight capability.

9.3 THE POSSIBILITY OF CLASSIFYING SMART CONTRACTS AS ADMINISTRATIVE CONTRACTS

The classification of smart contracts as 'administrative contracts' remains subject to legal debate, as administrative contracts traditionally require:

- The participation of a public authority as a party;
- A connection to public service or public interest;
- The inclusion of exceptional clauses not found in private law.



French administrative jurisprudence, starting with the Conseil d'État ruling in Époux Bertin (1956), held that contributing to the execution of public service suffices for administrative contract status. By contrast, Egypt's Supreme Administrative Court requires all three criteria, particularly the presence of exceptional clauses (see Case 4227/54S.A.C., 19 June 2011).

Thus, for smart contracts to be classified as administrative contracts, they must meet these traditional criteria. Challenges include:

1. Contracting Entity: While public entities may use smart contracts, issues arise when contracts are executed via digital interfaces without human signatures, conflicting with Egyptian administrative law requirements for formal authorization and assignment documentation. The Court ruled in Case 2850/61S.A.C., 24 Dec 2016: "An administrative contract must be documented by an official instrument signed by the competent authority."

2. Public Service Link: Smart contracts in procurement often serve public utilities, but their automated execution may reduce administrative flexibility in adjusting terms for public interest needs.

3. Exceptional Clauses: Administrative contracts typically grant unilateral powers to the administration, such as modification or termination. Smart contracts, in contrast, execute terms rigidly post-activation.

Some French scholars distinguish between traditional and technological administrative contracts, suggesting that if control and amendment functions are embedded in the code, smart contracts may qualify. (see: N. Fricero, 'Le contrat administratif à l'ère du numérique', AJDA, 2022, p. 113).

To classify smart contracts administratively, the following adaptations are necessary:

- Inclusion of automatic conditional modification clauses (e.g., force majeure) within the code;
- Certification through an official governmental digital system;
- Integration of audit mechanisms to enable judicial review.

Therefore, not all smart contracts can be considered administrative. Their legal classification depends on the presence of public law elements and adaptability of design to allow administrative control. Legislative reform is essential to define their legal status without compromising oversight and protection of public funds.

Chapter Two: Legal and Regulatory Challenges of Smart Administrative Contracts

Section 1: Legal Challenges in Administrative Law

9.4 THE AVAILABILITY OF THE ELEMENTS OF ADMINISTRATIVE CONTRACTS IN THE SMART MODEL

Administrative contracts, unlike civil contracts, must meet specific formal and institutional requirements, including:

- Issuance by a legally competent administrative authority;
- Documentation through formal procedures;
- Signature by an authorized official.
- Availability of prior financial or administrative approval for financial obligations.

Smart contracts replace these steps with a sequence of self-executing code, raising several legal issues:

- Absence of formal signature: Weakens legal proof;
- Lack of documented authority or delegation: Contradicts traditional administrative practice.

The Egyptian Supreme Administrative Court ruled: “A contract issued by an unauthorized entity or not executed in the legally prescribed form is absolutely void.” (Case 3154/58S.A.C., 20 Feb 2016).

In France, however, some texts allow broader interpretation of electronic documentation, provided contract origin and intent can be verified. The Conseil d’État ruled in Commune de Toulouse, 12 Jan 2021, that digital signatures are valid if processed through approved platforms.

Further challenges arise with:



- **Administrative Discretion:** Smart contracts, once activated, are rigid, eliminating the possibility of adaptation based on changing circumstances. This contradicts the principle of proportionality and discretion central to administrative law. Dr. Ahmed El-Shazly notes: “Automatic execution in smart contracts conflicts with administrative balancing principles, as it restricts the administration’s response to economic or exceptional changes.” (El-Shazly, *Digital Administrative Contracts*, Dar Al-Nahda, 2021, p. 194);

- **Legality of Subject Matter:** Contracts must involve a lawful, clear, and feasible subject. Smart contracts obscure terms in complex code, limiting judicial understanding.

The Egyptian Supreme Administrative Court ruled: “Contracts with ambiguous subject matter or incomprehensible means of execution are void.” (Case 2112/60S.A.C., 9 June 2018).

These issues indicate a fundamental tension between traditional administrative contract requirements and smart contract characteristics, demanding legislative adaptation to align digital mechanisms with the legal safeguards essential for public service delivery.

9.5 ADMINISTRATIVE LIABILITY FOR BREACH AND REMEDIES

In classical administrative contracts, any breach—by the administration or the contractor—can establish liability, whether contractual or tortious. Such liability is subject to judicial and administrative oversight and affected parties may seek redress through grievance procedures and judicial appeals.

In smart contracts, however, breaches may stem not from deliberate acts or omissions but from technical faults in the programmed code or unintended automatic execution. This raises key questions: Who is responsible? The administration that designed the code? The technical contractor? Or the counterparty who failed to anticipate the outcome?

Dr. Adel Sultan explains: “Breach in smart contracts may not be intentional, but rather the result of undetectable technical error, requiring a reconsideration of



traditional administrative liability doctrines.” (Sultan, Smart Contracts in Administrative Law, Legal Research Journal, Ain Shams University, 2022, p. 313).

Examples of Breach in Smart Contracts:

- Programming Error: The contract executes unintended clauses due to flawed coding;
- Changed Circumstances: Economic shifts or disasters impact contract fairness without pre-coded conditional adjustments;
- Technical Disruption: Blockchain network outages or loss of cryptographic keys interrupt execution.

Dubai Digital Authority’s 2021 report indicated that 12% of trial-phase smart contracts faced execution issues due to technical or inflexible conditions, underscoring the legal risk of deploying such systems without robust safeguards.

Administrative liability includes:

- Faulty contract design or coding specifications;
- Failure to implement review mechanisms or corrective triggers;
- Neglect of extraordinary conditions affecting contractual equity.

In Case 1334/55S.A.C., 22 Oct 2016, the Egyptian Supreme Administrative Court held: “The administration is liable for damages suffered by the contractor if failure stems from inadequate oversight, supervision, or inappropriate contract documentation.”

In France, scholars differentiate between material breach and code-based breach, recommending pre-activation legal reviews.

Olivier Renaudie writes: “The administration must bear responsibility for poorly coded smart contracts if failure results from lack of oversight or unfair clauses.” (Renaudie, Administrative Law and Digitalization, Dalloz, 2021, p. 154).

Remedies require adapting traditional grievance procedures:



- Human override clauses within code;
- Digital grievance platforms to allow suspension or appeals;
- Mandatory legal review before smart contract deployment.

Dubai's Department of Finance issued Circular No. 12 (2021) requiring that all smart contracts undergo legal vetting to ensure they include mechanisms for suspension, modification, or appeal in case of malfunction. Egypt's grievance procedures under Public Procurement Law remain manual and do not yet accommodate smart contract speed or automation.

9.6 EVIDENTIARY VALUE OF SMART CONTRACTS BEFORE THE ADMINISTRATIVE JUDICIARY

Administrative courts generally require that contracts be evidenced by official or certified electronic documents signed by the competent administrative authority. This standard contrasts with smart contracts, which are self-executing code blocks stored on blockchain networks and lack traditional documentation and human signatures.

Article 27 of Egypt's Law of Evidence No. 25 of 1968 states: "Electronic writing, when legally validated, constitutes legal proof." The Electronic Signature Law No. 15 of 2004 reaffirmed this principle. However, these laws do not automatically apply to smart contracts, as code blocks are not traditionally legible text nor do they include standard digital signatures.

In a 2020 opinion (File No. 104/4/3675), Egypt's State Council stated: "Electronic dealings alone do not meet full evidentiary standards in administrative contracts unless issued by an authorized entity and contain auditable certification."

In France, administrative courts are more flexible in recognizing electronic evidence. The Conseil d'État's 2021 ruling in Commune de Bayonne confirmed that digital contracts providing transparency and traceability are valid even without paper signatures.

However, smart contracts introduce new complexities:

- Lack of Interpretability: Code is not easily readable by judges.



- Cross-border Execution: Blockchain may operate beyond national jurisdiction, complicating venue and enforcement.

- Absence of Legal Framework: No Egyptian, Emirati, or French statute explicitly recognizes smart contracts as formal administrative evidence.

The Egyptian Supreme Administrative Court ruled in Case 2410/58S.A.C., 14 Oct 2017: “An administrative contract is void if official proof elements are lacking, even if partially or fully executed.”

To address these gaps, legal scholars suggest:

- Translating code into human-readable contractual summaries;
- Mandating registration of smart contracts in state-approved digital repositories;
- Enacting executive regulations defining evidentiary conditions for smart contracts.

France has piloted a system called 'Contrat Public Numérique' for legally interpretable smart contracts developed jointly by the Ministry of Economy and the State Council.

Thus, until statutory recognition evolves, smart contracts may remain legally ambiguous in evidentiary terms before administrative courts.

Section 2: Oversight of Smart Contracts in Government Procurement

9.6 LIMITS OF ADMINISTRATIVE AND FINANCIAL OVERSIGHT IN THE DIGITAL ENVIRONMENT

Oversight in traditional administrative contracts relies on:

- Internal controls (evaluation committees, monitoring units);
- Financial oversight (audit bureaus, regulatory bodies);
- Judicial oversight (State Council and supreme administrative courts).

These mechanisms depend on human review of paper or digital documents and operate under principles of ongoing or ex-post scrutiny.



The Egyptian Supreme Administrative Court stated: "Oversight remains applicable to any contract involving public funds or services and cannot be waived due to procedural convenience or technology." (Case 2357/55S.A.C., 10 Dec 2016).

Smart contracts present significant challenges to traditional oversight:

- Human Traceability: Code lacks a transparent trail for administrative or financial auditors;
- Lack of Traditional Documentation: No printed contract, invoices, or reviewable logs exist;
- Diffused Responsibility: Execution may occur across decentralized servers, obscuring jurisdiction and accountability.

Dr. Mohamed Gad El-Rab notes: "Financial oversight faces a legal vacuum when dealing with smart contracts due to the absence of conventional documentation and material audit evidence." (Gad El-Rab, Financial Oversight of Smart Contracts, Journal of Public Law, 2022, p. 214).

Comparative responses:

In the UAE:

- Dubai's Department of Finance launched a Smart Audit Chain system, triggering alerts for every execution event in a smart contract.
- The Federal Audit Bureau issued a 2021 directive mandating audit-compatible programming clauses in all smart contracts.

In France:

- The State Council's Public Procurement Committee recommended using 'auditable smart contracts' (contrat auditable) with embedded checkpoints for regulatory review.

"Execution oversight must be embedded in the contract code with stoppoints for human intervention when necessary" (State Council Report, 2021, p. 198).

Recommended practices include:

- Requiring smart contracts to be audit-compatible
- Establishing digital audit units within ministries
- Training legal officers in code literacy



- Registering smart contracts in central government repositories

The World Bank's 2022 report on administrative digitization concluded: "Governments adopting smart contracts must deploy parallel monitoring interfaces to ensure a level of oversight comparable to traditional contracts."

9.8 ROLE OF AUDIT AND CONTROL BODIES IN VERIFYING PROPER EXECUTION

In Arab legal systems, audit and control bodies play a central role in reviewing administrative contracts. These institutions are responsible for:

- Examining contractual documents;
- Verifying procedural compliance;
- Auditing implementation and adherence to budgetary limits;
- Detecting irregularities and mismanagement.

Key institutions include:

- Egypt: Central Auditing Organization and Administrative Control Authority;
- UAE: Federal Audit Bureau and local audit departments;
- France: Cour des Comptes (Supreme Audit Court) and Inspectorate General of Finance.

The Egyptian Supreme Administrative Court held: "Audit reports based on neutral documentation and examination hold evidentiary value in administrative contract disputes." (Case 1754/57S.A.C., 11 Feb 2017).

Smart contracts challenge these institutions due to:

- Absence of physical documents (e.g., award records, invoices);
- Inaccessibility of code (written in languages such as Solidity);
- Automated execution without prior review;
- Decentralized hosting beyond national oversight.



Emerging Practices:

In the UAE:

- Dubai established a Smart Contract Compliance Unit within its Department of Finance;
- It launched the Smart Contract Compliance Checker for code verification pre-execution;
- The Federal Procurement Authority mandates that all smart contracts include audit-trigger clauses.

In France:

- Cour des Comptes proposed a dedicated unit for smart contract oversight in cooperation with the Ministry of Finance.
- It recommended a standardized contract template allowing administrative readability.

"Traceability and interoperability are essential for financial verification of automated contracts." (Cour des Comptes, Digital Transformation Report, 2021, p. 207).

Recommendations:

- Amend audit laws to explicitly include smart contracts;
- Register all public smart contracts in central state databases;
- Require automatic logging and audit alerts in contract code;
- Train hybrid teams with both legal and technical audit expertise;
- Issue model smart contracts with built-in oversight mechanisms.

9.9 JUDICIAL OVERSIGHT MECHANISMS AND PROTECTION OF PUBLIC FUNDS

Judicial oversight is a key pillar in safeguarding legality and protecting public funds in administrative contracts. Administrative courts review contract formation, execution, and termination, ensuring public interest and legality.



In Egypt, the State Council has consistently ruled that judicial supervision extends to all administrative acts involving public funds or services. In Case 2217/60S.A.C., 15 July 2018, the court ruled: “Administrative contracts must remain subject to judicial review regardless of their technical form or method of execution.”

Smart contracts complicate this oversight:

- Execution may occur without prior notification or documentation;
- Contract code is often inaccessible to judges;
- Enforcement mechanisms may lie outside national jurisdiction.

Dr. Sherif El-Din writes: “Judicial review is hindered by technical opacity, automated execution, and lack of prior scrutiny in smart contracts.” (El-Din, Blockchain and Public Procurement, Cairo Law Review, 2021, p. 237).

Judicial Practices and Reforms:

In France:

- The Conseil d'État emphasized in its 2022 report on digital public services that administrative judges must develop digital literacy to adjudicate smart contract disputes;

- A proposal was submitted to create a digital chamber within administrative courts to handle disputes related to automated contracts.

In the UAE:

The Federal Judiciary Council approved a proposal for 'Digital Contract Review Panels' in 2023, tasked with interpreting code-based clauses in public procurement;

- Dubai's Smart Judiciary Strategy includes blockchain dispute training for administrative judges.

Recommendations:

- Establish judicial units specialized in digital contract disputes;
- Require certified code summaries in plain language for every smart administrative contract;
- Develop guidelines on admissibility and enforcement of automated contracts in administrative litigation;



- Cooperate with IT experts during judicial investigations of contract code.

Ultimately, judicial oversight must evolve in parallel with smart contract deployment to ensure continued legal protection, equitable execution, and reservation of public funds.

10 CONCLUSION

This study has examined the legal and administrative adaptation required to integrate smart contracts into government procurement. Through comparative analysis of Egypt, the UAE, and France, it became evident that while smart contracts offer efficiency, transparency, and automation, they simultaneously challenge traditional legal frameworks.

Key findings include:

- Smart contracts lack formal elements traditionally required in administrative contracts, such as human negotiation, clear documentation, and judicial oversight;
- Existing legal systems are not yet fully equipped to address the evidentiary and supervisory requirements posed by autonomous digital execution;
- Public interest may be compromised if contracts are rigid, opaque, or executed without discretionary review.

Despite these challenges, various jurisdictions have begun to introduce reforms, such as audit-trigger clauses, judicial training, and digital contract registration. These developments highlight a growing recognition of the need to bridge technological tools with legal accountability.

For smart administrative contracts to gain legitimacy and effectiveness, law and technology must advance together, ensuring that public procurement remains transparent, equitable, and subject to effective control.

Recommendations

Based on the findings of this research, the following recommendations are proposed:

1. ****Legislative Reform****: Amend public procurement laws in Egypt and similar jurisdictions to explicitly define and regulate smart contracts.



2. ****Contract Design****: Require that smart contracts include human-readable summaries and conditional clauses for suspension or modification.
3. ****Judicial Capacity Building****: Establish specialized units within administrative courts to interpret and adjudicate smart contract disputes.
4. ****Audit Compatibility****: Mandate code-based logging systems and registration in national digital repositories for public contract traceability.
5. ****Cross-disciplinary Training****: Provide training for public administrators, legal professionals, and auditors on smart contract technology.
6. ****Pilot Programs****: Encourage government agencies to pilot smart contracts in low-risk procurement areas under strict oversight.

By implementing these steps, smart administrative contracts can evolve into a regulated and beneficial component of modern public procurement frameworks, aligning innovation with legal integrity.

REFERENCES

- ARAFA, A. Legal Characterization of Smart Contracts. *Cairo University Law Journal*, Cairo, 2022.
- COUR DES COMPTES. *Digital Transformation Report*. Paris, 2021.
- DUBAI DIGITAL AUTHORITY. *Smart Contracts Report*. Dubai, 2021.
- EGITO. *Law No. 15 of 2004 on Electronic Signature*. Cairo, 2004.
- EGITO. *Law No. 25 of 1968 on Evidence*. Cairo, 1968.
- EGITO. *Law No. 182 of 2018 on Public Procurement*. Cairo, 2018.
- EGITO. *Supreme Administrative Court*. Cases: 2666/49 S.A.C. (2007); 2850/61 S.A.C. (2016); 4227/54 S.A.C. (2011); 2112/60 S.A.C. (2018); 2410/58 S.A.C. (2017); 2217/60 S.A.C. (2018); 1754/57 S.A.C. (2017); 1334/55 S.A.C. (2016); 3154/58 S.A.C. (2016); 2357/55 S.A.C. (2016).
- EL-DIN, S. Blockchain and Public Procurement. *Cairo Law Review*, Cairo, 2021.
- EL-SHAZLY, A. *Digital Administrative Contracts*. Cairo: Dar Al-Nahda Al-Arabia, 2021.
- FRANÇA. *Conseil d'État*. Jurisprudência: Commune de Toulouse (2021); Commune de Bayonne (2021); Époux Bertin (1956).



FRICERO, N. Le contrat administratif à l'ère du numérique. *Actualité Juridique – Droit Administratif (AJDA)*, p. 113, 2022.

GAD EL-RAB, M. Financial Oversight of Smart Contracts. *Journal of Public Law*, Cairo, 2022.

MEKKI, M. *Les contrats à l'épreuve du numérique*. Paris: Dalloz, 2021.

RACINE, J.-B. La justice administrative et la révolution numérique. *Revue Française de Droit Administratif – RFDA*, p. 93, 2022.

RENAUDIE, O. *Administrative Law and Digitalization*. Paris: Dalloz, 2021.

STATE COUNCIL (France). *Public Procurement and Digital Administration*. Paris, 2021.

SULTAN, A. Smart Contracts in Administrative Law. *Legal Research Journal, Ain Shams University*, Cairo, 2022.

SZABO, N. *The Idea of Smart Contracts*. 1997. Disponível em: <https://www.fon.hum.uva.nl/rob/Courses/InformationInSpeech/CDROM/Literature/LOTwinterschool2006/szabo.best.vwh.net/smart.contracts.html>. Acesso em: 25 set. 2025.

UNITED ARAB EMIRATES. *Federal Procurement Policies and Dubai Department of Finance Circulars*. Dubai, 2021.

WORLD BANK. *Public Sector Digitalization Toolkit*. Washington, 2022.