



The Legal Impact of Artificial Intelligence Technologies on Public Administration: An Administrative Law and Islamic Legal Ethics Perspective

Ahmed Adil Musa Al-Hayani

University of Fallujah, Iraq

* Corresponding Author: ahmed.a.musa@uofallujah.edu.i

DOI: <https://doi.org/10.33084/mg.v6i2.13239>

Received: 13-06-2026

Revised: 03-08-2026

Accepted: 09-08-2026

Article	Abstract
Keywords: Artificial intelligence; public administration; administrative law; Islamic legal ethics; algorithmic governance. How to cite: Al-Hayani, A. A. M. (2026). The Legal Impact of Artificial Intelligence Technologies on Public Administration: An Administrative Law and Islamic Legal Ethics Perspective. <i>Mitsaqan Ghalizan</i>, 6(2), 70–92. https://doi.org/10.33084/mg.v6i2.13239	Artificial intelligence (AI) has become a transformative force in public administration, reshaping governmental decision-making, administrative efficiency, and public service delivery. However, its increasing integration raises complex legal and ethical questions regarding accountability, transparency, liability, the protection of fundamental rights, and the ethical legitimacy of automated administrative decision-making. This paper examines the legal impact of AI technologies on public administration from the perspectives of administrative law and Islamic legal ethics, focusing on how traditional administrative law principles are challenged by autonomous and algorithm-driven decision-making systems. The study adopts a doctrinal legal approach combined with a comparative analysis of national and international regulatory frameworks, including the OECD AI Principles, the UNESCO Recommendation on the Ethics of Artificial Intelligence, and the European Union Artificial Intelligence Act. The analysis demonstrates that while AI enhances administrative performance and policy effectiveness, it simultaneously creates legal uncertainty due to algorithmic opacity, fragmented regulation, unclear liability attribution, and insufficient ethical safeguards. From the perspective of Islamic legal ethics, the legitimacy of AI in public administration depends on its consistency with the principles of justice (al-'adl), public welfare (maṣlaḥah), accountability (ma'sulīyyah), and the prevention of harm (lā ḍarar wa lā ḍirār). The study concludes that effective AI governance requires comprehensive legal reform integrating transparency, meaningful human oversight, enforceable regulatory standards, and ethical principles capable of ensuring that technological innovation remains consistent with constitutional values and the objectives of good governance.



Copyright ©2026 by Author(s); Published by [Institute for Research and Community Services Universitas Muhammadiyah Palangkaraya](#). This is Open Access article under the CC-BY-SA License (<http://creativecommons.org/licenses/by-sa/4.0/>).

INTRODUCTION

Artificial intelligence (AI) is transforming public administration by enhancing governmental decision-making, administrative efficiency, and public service delivery. Governments increasingly use machine learning, predictive analytics, and intelligent automation to strengthen governance, optimize resources, and deliver citizen-

centered digital services..¹ Consequently, AI is increasingly recognized as a strategic tool for digital government and administrative reform rather than merely a technological innovation. However, its autonomous decision-making capabilities challenge traditional principles of administrative discretion, transparency, accountability, and liability. Although AI enhances governmental efficiency and evidence-based decision-making, it also raises concerns regarding algorithmic opacity, bias, explainability, accountability, and democratic legitimacy.²

Recent scholarship emphasizes that AI's legal implications extend beyond technical regulation to core principles of administrative law and constitutional governance. As automated systems increasingly influence individual rights and obligations, transparency, judicial oversight, and accountability are essential to preserving public trust and the rule of law.

This research highlights the urgent need for a comprehensive legal framework governing AI in public administration. Without clear rules on automated decisions, liability, privacy protection, and institutional oversight, AI may weaken rather than enhance good governance. Although existing studies address AI ethics and digital governance, limited attention has been given to the integrated relationship between AI and administrative law, particularly regarding the combined implications of transparency, accountability, privacy, and liability.

From an Islamic legal ethics perspective, the governance of AI in public administration also requires consideration of normative principles that emphasize justice (*'adl*), public benefit (*maslahah*), trustworthiness (*amanah*), accountability (*mas'uliyah*), and the prevention of harm (*dar' al-mafasid*). These principles provide an ethical framework for assessing whether AI-assisted governmental decisions remain oriented toward human dignity, fairness, and the public interest. Integrating Islamic legal ethics with administrative law therefore offers a broader normative perspective for addressing the legal and ethical challenges of AI, particularly in ensuring that technological efficiency does not override fundamental rights, governmental accountability, and justice in public administration.

Employing a doctrinal and comparative legal approach, this study examines international AI governance initiatives and analyzes key legal challenges, including liability, legislative gaps, data protection, and administrative oversight. It argues that effective AI integration in public administration requires legal reform based on transparency, accountability, meaningful human control, and the protection of constitutional rights.

¹ Anneke Zuiderwijk, Yu-Che Chen, and Fadi Salem, "Implications of the Use of Artificial Intelligence in Public Governance: A Systematic Literature Review and a Research Agenda," *Government Information Quarterly* 38, no. 3 (2021): 101577, <https://doi.org/10.1016/j.giq.2021.101577>.

² Anneke...

METHOD

This study employs normative legal research using statutory, conceptual, and Islamic legal approaches to examine the legal impact of Artificial Intelligence (AI) technologies on public administration. The study analyzes primary legal materials, including legislation, regulations, and official policy documents concerning public administration, digital governance, data protection, and AI, supported by secondary materials from scholarly books and peer-reviewed journal articles. Data are collected through library research and analyzed qualitatively by examining the compatibility of AI-based administrative practices with principles of legality, accountability, transparency, due process, and protection of citizens' rights, as well as Islamic legal-ethical principles such as justice (*'adl*), public benefit (*maslahah*), trustworthiness (*amanah*), prevention of harm (*dar' al-mafasid*), and human dignity. The analysis aims to identify regulatory gaps and formulate a normative framework for responsible, accountable, and ethically grounded AI use in public administration.

RESULTS AND DISCUSSION

The Theoretical and Legislative Framework of Artificial Intelligence Technologies in Public Administration

Understanding the theoretical and legislative framework of artificial intelligence (AI) is essential for analyzing the legal challenges of its use in public administration. Examining AI's concept, evolution, and administrative applications provides the basis for assessing legal risks and identifying gaps in existing regulatory frameworks. The absence of effective AI regulation in the public sector may increase misuse, weaken legal accountability, and undermine transparency, fairness, and good governance. Although many countries have begun developing AI regulatory frameworks, these efforts remain fragmented and continue to face legislative and conceptual challenges regarding the legal governance of AI technologies.³ Accordingly, this section examines, in its first requirement, the precise definition of artificial intelligence, its technical characteristics, and its principal applications in public administration. The second requirement analyzes the national and international legislative frameworks governing these technologies, with particular emphasis on their adequacy in responding to rapid technological developments and their capacity to provide effective legal protection within an increasingly complex and continuously evolving digital environment.

³ Zimmermann, A., Schmidt, R., Alt, R., Masuda, Y., Chehri, A. (2023). Digital Strategy and Architecture for Human-Centered Intelligent Systems. In: Zimmermann, A., Howlett, R., Jain, L.C. (eds) Human Centred Intelligent Systems. KES-HCIS 2023. Smart Innovation, Systems and Technologies, vol 359. Springer, Singapore. https://doi.org/10.1007/978-981-99-3424-9_4

The Concept of Artificial Intelligence and Its Administrative Applications

Artificial intelligence (AI) has become a transformative force in public administration, automating processes, analyzing large datasets, and raising important legal issues related to transparency, accountability, and administrative oversight. Accordingly, understanding its nature, evolution, and technical characteristics is essential before examining its legal implications in the administrative sector. AI lacks a universally accepted definition. Some scholars describe it as the simulation of human intelligence, while others define it as software capable of learning and making decisions with limited human intervention. This conceptual diversity poses challenges for legal systems seeking to establish a coherent regulatory framework for AI.⁴ Furthermore, the increasing use of AI in public administration including human resource management, application processing, and predictive planning raises important questions regarding the compatibility of such applications with the fundamental legal principles governing administrative action, foremost among them the principle of legality.

First: Definition of Artificial Intelligence: Concept, Origin, and Development

Artificial intelligence represents one of the most prominent manifestations of the contemporary technological revolution. In its simplest definition, it refers to the ability of computer systems to simulate certain aspects of human intelligence, including understanding, learning, and reasoning.⁵ Artificial intelligence has also been described as a branch of computer science research that seeks to develop intelligent systems based on digital technologies to provide efficient solutions to complex problems.⁶ Alternatively, it may be defined as the scientific discipline dedicated to producing intelligent machines or systems possessing capabilities analogous to those of the human mind.⁷ AI has been defined as the science of designing advanced algorithms that simulate human cognitive abilities, including perception, learning, problem-solving, communication, and knowledge management. It is also described as a technological field that enables machines to perform tasks and make decisions either under human supervision or autonomously without direct human control.⁸ the

⁴ Ismā'īl 'Abd al-Fattāḥ 'Abd al-Kāfī, *al-Thawrah al-Raqmiyyah wa al-Dhakā' al-Ṣinā'i fī al-Qarn al-Hādī wa al-'Isbrīn* (Cairo: al-Dār al-Thaqāfiyyah lil-Nashr, 2020).

⁵ Lindner, Felix. (2020). Robert Mattmüller, and Bernhard Nebel, Evaluation of the moral permissibility of action plans. *Artificial Intelligence*, Volume 287, October 2020.

⁶ Christian Djefal, *Artificial Intelligence and Public Governance: Normative Guidelines for Artificial Intelligence in Government and Public Administration*, January 2020, pp.277-290. DOI: 10.1007/978-3-030-32361-5_12

⁷ Mahmood Shaker Abood Alaloosh. Integrating Ricardian contracts with SQL databases: A legal and technical framework for digital commerce in Iraq. *Int J Civ Law Legal Res* 2026;6(2):23-28. DOI: [10.22271/civillaw.2026.v6.i2a.192](https://doi.org/10.22271/civillaw.2026.v6.i2a.192)

⁸ Bashīr 'Alī 'Arnūs, *al-Dhakā' al-Iṣṭinā'i* (Cairo: Dār al-Saḥāb lil-Nashr wa-al-Tawzī', 2008).

term artificial intelligence was introduced at the 1956 Dartmouth Conference, establishing AI as a research field focused on creating machines capable of human-like learning and reasoning. Initially theoretical, AI has evolved into a practical technology enabled by advances in computing and machine learning, with applications across sectors such as commerce, healthcare, and public administration.⁹ Artificial intelligence has evolved from rule-based systems to advanced deep learning and neural network models capable of learning from data and adapting to changing environments. As AI assumes a greater role in public administration, it raises important legal questions regarding administrative discretion, accountability, and the rule of law.¹⁰

Second: The Technical and Functional Characteristics of Artificial Intelligence

Artificial intelligence possesses a range of technical and functional characteristics that distinguish it from conventional information systems, enabling it to perform complex tasks requiring the rapid and accurate processing of massive amounts of information.¹¹ Technically, AI relies on advanced algorithms, machine learning, and neural networks that enable systems to learn from data, adapt to new information, and improve performance with minimal human intervention. These capabilities make AI effective in solving complex and evolving problems. Functionally, AI supports data analysis, decision-making, forecasting, and intelligent interaction, with broad applications in public administration. It can also operate continuously and perform multiple tasks efficiently, enhancing administrative productivity and service delivery.¹² These characteristics significantly enhance the role of artificial intelligence in modernizing public administration and making it more flexible, efficient, and responsive.

Third: Major Applications of Artificial Intelligence in Public Administration

Artificial intelligence is transforming public administration by improving governmental efficiency and the quality of public services. Its applications streamline

⁹ Tāriq al-Sayyid Maḥmūd Abū 'Uqayl, "The Role of Artificial Intelligence Technologies in Combating Cyber Terrorism," paper presented at the Second International Scientific Conference of Al-Zaytoonah University of Jordan, *Rule of Law and Artificial Intelligence: Challenges and Prospects*, Amman, Jordan, November 21–22, 2023.

¹⁰ Muḥammad Qarnī Amīn Ḥasan, "Digital Transformation in the Light of Public Interest: A Maqāṣidī and Uṣūlī Study," *Journal of Sharia and Law* 41 (April 2023): 67–145, <https://doi.org/10.21608/mawq.2023.299427>.

¹¹ Mahinour Abou El Seoud, "Exploring the Potential of E-Government in Reducing Corruption: Case of Egypt" (Master's thesis, American University in Cairo, 2024), AUC Knowledge Fountain, <https://fount.aucegypt.edu/etds/2207>

¹² Reza Montasari, "Cyber Threats and National Security: The Use and Abuse of Artificial Intelligence," in *Artificial Intelligence and National Security*, ed. Reza Montasari (Cham: Springer, 2022)

administrative processes, enhance decision-making, and support more responsive service delivery. In human resource management, AI assists in screening job applications and identifying qualified candidates more objectively while reducing administrative costs. AI-powered chatbots also provide continuous citizen support, answering inquiries and facilitating administrative procedures more efficiently.¹³ Governments increasingly use AI to analyze large datasets in sectors such as healthcare, education, and the economy. By forecasting trends and generating evidence-based insights, AI supports more informed public policymaking and improves the quality of governmental decisions. Advanced techniques, including deep learning and neural networks, further enhance strategic planning and public service delivery.¹⁴

The public service sector is both a vital social function and the primary channel of interaction between governments and citizens. Accordingly, the adoption of AI and other intelligent technologies has become an important indicator of a government's commitment to improving public services and strengthening governance.¹⁵ Contemporary governance extends beyond the exercise of sovereign authority to promoting public welfare through modern administrative models that can respond effectively to emerging challenges and evolving societal needs.¹⁶ Internationally, Singapore is a leading example of AI integration in public administration. The government uses AI to analyze social data and improve healthcare and education services, contributing to better public service delivery and citizens' quality of life.¹⁷ In the Arab world, the United Arab Emirates has emerged as a regional leader in AI adoption, using AI under its Smart Government initiatives to streamline public services and enhance the citizen experience.¹⁸ Other countries,

¹³ Dalal Kettani and Fadwa Ammor, "From E-Government to AI Government: Challenges and Opportunities in Developing Countries," 2020.

¹⁴ Andreas Kaplan and Michael Haenlein, "Siri, Siri, in My Hand: Who's the Fairest in the Land? On the Interpretations, Illustrations, and Implications of Artificial Intelligence," *Business Horizons* 62, no. 1 (2019): 15–25, <https://doi.org/10.1016/j.bushor.2018.08.004>.

¹⁵ Uday M. Apte, Uday S. Karmarkar, and Hiranya K. Nath, "Information Services in the U.S. Economy: Value, Jobs, and Management Implications," *California Management Review* 50, no. 3 (2008): 12–30, <https://doi.org/10.2307/41166443>.

¹⁶ Muḥammad Nāṣir Muḥammad Muṭlaq Duhaym al-ʿUtaibī, "Digital Transformation and Its Impact on Public Utilities," *Journal of Legal and Economic Sciences*, vol. 64, no. 2 (2022): 1–48.

¹⁷ Nidhal Marjana and Samah Talhi, "Singapore's Digital Transformation Model: Achievements and Lessons Learned," *Journal of Economic and Financial Research*, vol. 11, no. 2 (2024): 305–326, <https://doi.org/10.37164/2056-011-002-014>.

¹⁸ Nādiyāh Ibrāhīm al-Sayyid Hunaidī, "International Experiences in Applying E-Government and the Challenges of Its Implementation in Arab Countries," *Scientific Journal of the Faculty of Economic and Political Studies*, vol. 2, no. 4 (July 2017): 97–120. (journals.ekb.eg)

including Saudi Arabia and Bahrain, have likewise initiated AI-based projects in areas such as cybersecurity and crisis management.¹⁹

The National and International Legislative Regulation of Artificial Intelligence in Public Administration

The rapid advancement of artificial intelligence (AI) has created significant legal challenges for national and international regulatory systems. As AI is increasingly used in public administration, particularly in decision-making and big data analysis, it raises important questions about whether existing legal frameworks are adequate to govern these emerging technologies.²⁰ AI regulation requires more than the enactment of new laws; it also demands the adaptation of traditional legal principles, including liability, transparency, and oversight, to address the autonomous and complex nature of AI technologies. At the national level, many countries have introduced legislative initiatives to regulate AI, focusing on ethics, privacy, and oversight of automated decision-making. Although these frameworks remain underdeveloped in many jurisdictions, AI has streamlined administrative processes and strengthened governments' capacity to formulate and implement public policies.²¹ Likewise, countries such as France and Canada have sought to develop legislative frameworks capable of responding to the challenges posed by artificial intelligence through the integration of transparency and accountability principles into administrative processes.²² Internationally, organizations such as the European Union and UNESCO have developed principles and guidelines to promote the responsible use of AI while safeguarding human rights, fairness, and transparency.²³ Nevertheless, there remains a pressing need for binding international legal frameworks governing the use of AI in public administration to strengthen regulation and address the risks associated with these technologies.

¹⁹ Abdulrahman Saad Alqahtani, "FSO-LSTM IDS: Hybrid Optimized and Ensembled Deep-Learning Network-Based Intrusion Detection System for Smart Networks," *The Journal of Supercomputing* 78, no. 7 (2022): 9438–9455, <https://doi.org/10.1007/s11227-021-04285-3>.

²⁰ Matthew U. Scherer, "Regulating Artificial Intelligence Systems: Risks, Challenges, Competencies, and Strategies," *Harvard Journal of Law & Technology* 29, no. 2 (2016): 353–400, <https://doi.org/10.2139/ssrn.2609777>.

²¹ Sergey Kamolov and Kirill Teteryatnikov, "Artificial Intelligence in Public Governance," in *Technology and Business Strategy: Digital Uncertainty and Digital Solutions*, ed. Igor Stepnov (Cham: Springer, 2021), 127–135, https://doi.org/10.1007/978-3-030-63974-7_9.

²² Anna Jobin, Marcello Ienca, and Effy Vayena, "The Global Landscape of AI Ethics Guidelines," *Nature Machine Intelligence* 1, no. 9 (2019): 389–399, <https://doi.org/10.1038/s42256-019-0088-2>.

²³ UNESCO, *Recommendation on the Ethics of Artificial Intelligence* (Paris: United Nations Educational, Scientific and Cultural Organization, 2021), <https://unesdoc.unesco.org/ark:/48223/pf0000381133>.

First: National Efforts to Regulate the Use of Artificial Intelligence in Public Administration

As AI becomes increasingly integrated into public administration, many countries have introduced legislative and regulatory measures to align its use with legal principles and constitutional rights. These efforts seek to bridge the gap between rapid technological advancement and traditional legal frameworks, particularly in relation to transparency, accountability, and the protection of individual rights.²⁴ In France, the National Commission on Informatics and Liberty (CNIL) has issued guidelines for the use of AI in the public sector, emphasizing transparency, human oversight of automated decisions, and the explainability of administrative decision-making.²⁵ Germany's 2018 National Artificial Intelligence Strategy requires ethical and legal assessments of AI applications in public institutions, with particular emphasis on fairness and preventing discriminatory bias.²⁶ In the Arab region, the United Arab Emirates has advanced AI governance through its 2017 AI Strategy and the establishment of a Ministry of Artificial Intelligence. The strategy promotes AI integration across government while emphasizing data protection, accountability, and a regulatory framework that supports innovation.²⁷ Egypt adopted its National Artificial Intelligence Strategy in 2021, emphasizing the development of a legal framework for AI in public institutions and supporting legislation to protect privacy and citizens' rights.²⁸ Despite these initiatives, many countries still lack comprehensive, binding legislation governing AI in public administration. Existing frameworks often rely on broad principles or policy guidelines rather than enforceable rules, underscoring the need for more robust legal frameworks that address the unique challenges of AI technologies.

Second: Legal Challenges in the National Regulation of Artificial Intelligence

Despite significant regulatory efforts, many legal systems continue to face challenges in adapting to the evolving nature of AI in public administration. Key concerns include legal liability, algorithmic transparency, and effective oversight. One major challenge is that traditional legal frameworks were designed for human or corporate actors, making them ill-suited to address AI systems capable of

²⁴ Sārah 'Abd al-Karīm, "Law and Artificial Intelligence: A Study of Modern Legislative Frameworks," *Journal of Law and Technology*, vol. 9, no. 2 (2023): 112–137.

²⁵ Jennifer Thomas, *Legal Governance of Artificial Intelligence in the French Public Sector* (Paris: CNIL Publications, 2020).

²⁶ Angela Merkel et al., *Artificial Intelligence Strategy of the Federal Government* ("AI Made in Germany") (Berlin: Federal Government of Germany, 2018).

²⁷ Hasan H. Omar, *AI in Public Administration: The UAE Experience* (Dubai: Emirates Center for Strategic Studies and Research, 2020).

²⁸ Muhammad Youssef, *Artificial Intelligence and Digital Transformation in Egyptian Administrative Institutions* (Cairo: National Center for Legal Studies, 2022).

autonomous decision-making. This creates uncertainty in assigning legal responsibility when AI causes harm or makes decisions without direct human intervention..²⁹ This challenge is compounded by the inability of existing legal frameworks to distinguish between conventional software and AI systems capable of self-learning and adaptive behavior. A second challenge concerns assigning legal liability for harm caused by AI in public administration. Because responsibility may be shared among developers, public authorities, and system users, identifying the legally accountable party is often difficult.³⁰ This challenge is especially evident in automated administrative decisions, such as approving or rejecting citizens' applications based solely on algorithmic analysis. A third challenge is the lack of effective mechanisms to ensure algorithmic transparency and oversight. Because many AI systems rely on proprietary, opaque algorithms, they are difficult for regulators and affected individuals to scrutinize, undermining transparency and accountability in public administration.³¹ Finally, the use of AI in public administration raises significant challenges for protecting constitutional rights, particularly privacy, equality before the law, and protection against algorithmic bias. The absence of clear AI-specific legislation makes it difficult to ensure these rights are consistently safeguarded in administrative practice.³² Accordingly, national legal frameworks require comprehensive reform to address the unique characteristics of AI, ensuring a balance between administrative efficiency and the protection of legal rights and procedural safeguards.

Third: International and Regional Initiatives for the Administrative Regulation of Artificial Intelligence

In response to rapid advances in AI, international and regional organizations have developed regulatory frameworks to promote its responsible use in line with legal principles, ethical standards, and human rights. These initiatives seek to balance technological innovation with effective governance, particularly in public administration. A landmark initiative is UNESCO's 2021 Recommendation on the

²⁹ Mahmood Alaloosh, Govar Majed Ahmad, and Lara Adel Jabbar, "Adapting Iraqi Law to Smart Contracts: A Comparative Analysis Incorporating Islamic Law Principles and Consumer Protection in the Contemporary Digital Era," *Metro Islamic Law Review* 5, no. 1 (2026), <https://doi.org/10.32332/milrev.v5i1.13031>.

³⁰ Amīrah Muḥammad Ibrāhīm Sātī, "Cybercrime in the Saudi Legal System," *Journal of Al-Andalus for Humanities and Social Sciences*, vol. 10, no. 75 (June 2023): 91–117, <https://doi.org/10.35781/1637-000-075-004>.

³¹ Aḥmad Badrān, "Artificial Intelligence between Governmental Regulation Policies and Self-Regulation: A Theoretical Approach," *Hikama Journal*, vol. 4, no. 7 (November 2023): 93–110, <https://doi.org/10.31430/IJZH4708>.

³² Dararida Fandra Mahira, Dwi Suci Rohmahwatin, and Nabila Dian Suciningtyas, "Strengthening Multistakeholder Integrated through Shared Responsibility in the Face of Cyber Attacks Threat," *Lex Scientia Law Review* 4, no. 1 (2020): 59–69, <https://doi.org/10.15294/lesrev.v4i1.38191>.

Ethics of Artificial Intelligence, the first global framework addressing AI from ethical and legal perspectives. It promotes principles such as fairness, transparency, privacy, and human rights, while guiding member states in developing national AI governance policies.³³ Similarly, the OECD AI Principles (2019) emphasize that AI systems should remain subject to human oversight and respect democratic values, the rule of law, and fundamental rights. The OECD also encourages international cooperation through knowledge sharing and the establishment of national AI governance initiatives.³⁴ At the European level, the EU Artificial Intelligence Act (AI Act), proposed in 2021, introduced the first comprehensive legal framework for regulating AI through a risk-based approach. It imposes strict requirements on high-risk AI systems, particularly those used in public services and administrative decision-making, to address their legal and administrative risks.³⁵ Regionally, countries such as the United Arab Emirates and Saudi Arabia have introduced national AI strategies emphasizing governance and institutional oversight. However, these initiatives remain at an early stage and generally lack comprehensive, binding legislation specifically regulating AI in public administration.³⁶ Despite their importance, implementing these initiatives remains challenging, especially in developing countries with limited legislative and technological capacity. Ensuring the safe and responsible use of AI in public administration therefore requires stronger international cooperation, knowledge sharing, and common legal standards adaptable to different legal and institutional contexts.

Legal and Administrative Challenges of Using Artificial Intelligence Technologies in Public Administration

Public administration has undergone a fundamental transformation through the adoption of digital technologies, which support decision-making, improve public service delivery, and enhance administrative efficiency.³⁷ However, this transformation has also created significant legal and administrative challenges,

³³ Audrey Azoulay, *Recommendation on the Ethics of Artificial Intelligence* (Paris: UNESCO, 2021), <https://unesdoc.unesco.org/ark:/48223/pf0000381133>. (UNESCO)

³⁴ OECD, *Recommendation of the Council on Artificial Intelligence* (OECD Legal Instruments, 2019), <https://doi.org/10.1787/685d9a67-en>.

³⁵ Margrethe Vestager, *Proposal for a Regulation of the European Parliament and of the Council Laying Down Harmonised Rules on Artificial Intelligence (Artificial Intelligence Act)* (Brussels: European Commission, 2021), COM(2021) 206 final, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021PC0206>.

³⁶ Omar Sultan Al Olama, *The Arab Approach to Artificial Intelligence Regulation: Policy and Practice* (Dubai: Arab Center for Digital Policy Studies, 2022).

³⁷ Wafa El Hilali and Abdelmajid El Manouar, "Digital Business Models: Doing Business in the Digital Era," in *Innovations in Smart Cities Applications: Edition 3 (SCA 2019)*, ed. Mohamed Ben Ahmed et al., Lecture Notes in Intelligent Transportation and Infrastructure (Cham: Springer, 2020), https://doi.org/10.1007/978-3-030-37629-1_17.

particularly due to the absence of clear regulatory frameworks governing AI in the public sector. One key issue is legal liability for AI-generated decisions. As AI systems become increasingly autonomous, assigning responsibility for errors becomes more complex, highlighting the need to modernize existing legal frameworks to address emerging technologies.³⁸ From an administrative perspective, AI integration raises challenges related to institutional structures, the allocation of authority, and workforce management. It also requires governance frameworks that ensure transparency and accountability. Effective digital transformation therefore depends on comprehensive legal and regulatory frameworks governing the use of AI in public institutions.³⁹

Legal Challenges Related to Liability and Oversight of Artificial Intelligence

As AI becomes increasingly integrated into public administration, a comprehensive legal analysis is needed to address the challenges it poses for legal liability and institutional oversight. Because AI systems can autonomously influence decisions affecting individual rights and interests, they raise important questions about the adequacy of traditional legal frameworks.⁴⁰ Determining legal liability for AI-related harm is a major challenge because traditional liability rules are designed for human or corporate actors. As AI systems can make autonomous decisions, applying these rules becomes increasingly difficult. Proposed solutions include recognizing a limited electronic legal personality for AI or establishing collective compensation mechanisms for individuals harmed by AI systems.⁴¹ From an oversight perspective, AI systems that rely on opaque algorithms make accountability difficult and may undermine the legitimacy of administrative decisions. This highlights the need for clear legal frameworks ensuring that AI-based administrative decisions remain subject to judicial and institutional review to protect individual rights and maintain public trust.⁴²

First: Determining Legal Liability for Damages Caused by Artificial Intelligence

Determining legal liability for harm caused by AI is one of the greatest challenges facing modern legal systems. As AI becomes increasingly integrated into

³⁸ Mahā Yusrī ‘Abd al-Laṭīf, “Legal Liability for the Acts of Robots: An Analytical Study in Light of Civil Law Rules,” *Journal of Legal and Economic Research*, Ain Shams University, no. 75 (2023): 92–110.

³⁹ Fatma Rashwan, “Digital Transformation Challenges in Public Institutions: A Study in Light of Governance and Artificial Intelligence,” *Journal of Media Research*, Cairo University, 2023.

⁴⁰ Hala El-Dessouky, *Legal Liability for Artificial Intelligence in Civil Law* (Master’s thesis, Faculty of Law, Alexandria University, 2022).

⁴¹ ‘Abd al-Laṭīf, “Legal Liability for the Acts of Robots,”.

⁴² Rashwan, “Digital Transformation Challenges,” page number.

public administration and public services, identifying responsible parties and allocating liability has become a central legal issue.⁴³

1. Ambiguity of the Legal Actor

Advanced AI systems raise fundamental questions about legal responsibility for harm, particularly when they operate through autonomous learning with minimal human intervention. In such cases, it is often unclear whether liability should rest with the developer, programmer, public authority, or end user, creating legal uncertainty and complicating compensation for affected individuals.⁴⁴

2. Inadequacy of Traditional Legal Frameworks

Traditional civil liability is based on fault, damage, and causation. However, AI challenges these principles because its autonomous decision-making makes it difficult to establish fault or prove a clear causal link between the system's actions and the resulting harm. As a result, existing liability rules are often inadequate for AI-related disputes.⁴⁵

3. The Need for New Legal Models

To address these shortcomings, legal scholars have proposed alternative liability models, particularly strict liability, under which compensation is based on the occurrence of harm rather than proof of fault. Another proposal is to recognize a limited electronic legal personality for AI systems, allowing legal responsibility to be assigned directly or through their owners or developers, similar to corporate entities.⁴⁶

4. International Experiences in Regulating Liability

Several countries and regional organizations, particularly the European Union, have begun developing legal frameworks for AI liability. The proposed EU AI Act adopts a risk-based approach and requires accountability and transparency for high-risk AI systems. Similarly, Germany and France favor liability models for high-risk activities that facilitate compensation, while the United States generally assigns

⁴³ Youssef Al-'Ilaymi, *Civil Liability for Harm Caused by Artificial Intelligence* (Master's thesis, Faculty of Law, Ain Shams University, 2022).

⁴⁴ Muḥammad Abū Sha'r, "Civil Liability for Artificial Intelligence in the Context of Civil Law," *An-Najah University Journal for Research (Humanities)* 35, no. 7 (2021): 1403–1430.

⁴⁵ Sufyān Bouqra, "Civil Liability for Damages Resulting from the Use of Artificial Intelligence: A Comparative Study," *Journal of Legal and Political Sciences* 12, no. 1 (2021): 223–246.

⁴⁶ Aḥmad al-Rawwāsān, *Legal Framework for Artificial Intelligence Technologies in Civil Liability* (Master's thesis, Middle East University, Jordan, 2022).

responsibility to developers or operators, seeking to balance innovation with effective regulatory oversight.⁴⁷

Second: Legislative and Regulatory Gaps in the Field of Artificial Intelligence

Legislative gaps remain one of the greatest challenges in regulating artificial intelligence. Rapid technological advances have outpaced national and international legal systems, creating regulatory uncertainty that limits the safe and effective use of AI across multiple areas of law. Most legal systems still lack clear rules governing AI, including licensing, operational standards, and legal consequences. This gap exists in both developing and advanced countries, allowing AI to be deployed in legally uncertain environments that may threaten individual rights and undermine the rule of law.⁴⁸ This legislative gap raises serious concerns about the legality of AI systems that make autonomous decisions. As AI is increasingly used in sensitive areas such as healthcare prioritization and social welfare allocation, the absence of clear legal rules makes it difficult to assess whether these decisions comply with the principles of legality, fairness, and equality before the law.⁴⁹ Several international initiatives have attempted to address AI regulatory gaps, particularly the EU Artificial Intelligence Act (2021), which adopts a risk-based approach. It imposes obligations on high-risk AI developers concerning transparency, human oversight, and data documentation. However, the proposal has been criticized for focusing mainly on regulatory compliance while providing limited guidance on civil and criminal liability.⁵⁰ In the Arab region, most legal systems still lack specialized AI legislation and rely instead on general rules governing emerging technologies. This regulatory gap weakens oversight, creates legal uncertainty, and may discourage investment. It also poses challenges for courts in resolving AI-related disputes due to the absence of clear legal standards and judicial precedents.⁵¹ The risks of this legislative gap extend to fundamental rights, including privacy, access to information, and fair decision-

⁴⁷ European Commission, *Proposal for a Regulation of the European Parliament and of the Council Laying Down Harmonised Rules on Artificial Intelligence (Artificial Intelligence Act)*, COM(2021) 206 final (Brussels: European Commission, April 21, 2021), <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021PC0206>.

⁴⁸ Nahla Jaber, "The Legislative Gap in Artificial Intelligence and Its Impact on Civil Liability," *Journal of Legal Studies*, 18, no. 2 (2022): 155–180.

⁴⁹ Muḥammad Yāsīn, "Artificial Intelligence and the Principle of Legality in Administrative Law," *Journal of Administrative and Legal Sciences*, 7, no. 4 (2020): 112–134.

⁵⁰ Noura Al-Zahrani, "The European Regulation of Artificial Intelligence: An Analytical Reading of the New Legislative Proposal," *Journal of Law and Technology*, 9, no. 3 (2021): 201–225.

⁵¹ Suha Al-Rawi, "Digital Transformation and the Legislative Gap in the Arab Environment: An Analytical Study," *Arab Journal of Law*, 14, no. 1 (2022): 78–104.

making. When AI systems influence decisions affecting individuals without adequate legal oversight, the rule of law and principles of justice may be compromised.⁵²

Third: The Absence of Legal Standards for Evaluating Artificial Intelligence Systems

The expansion of AI applications has highlighted the absence of clear legal standards for assessing the legality, reliability, and fairness of these systems. Currently, there are no unified rules requiring pre-deployment evaluation of AI technologies or ensuring compliance with neutrality, transparency, and human rights principles. This gap is particularly concerning in sensitive sectors such as the judiciary, healthcare, and education, where AI decisions can significantly affect individuals. Without proper legal and technical assessment, AI systems may produce biased or inaccurate outcomes due to flaws in data and algorithmic design.⁵³ Most existing AI evaluation standards have been developed by non-binding organizations and expert groups rather than legislative authorities. As a result, they operate primarily as ethical guidelines rather than enforceable legal obligations. For example, the OECD AI Principles promote transparency, accountability, and human rights protection but do not have binding legal force.⁵⁴ The absence of legally binding evaluation standards allows AI developers to adopt their own criteria, leading to inconsistent practices across companies and jurisdictions. This weakens oversight and accountability while complicating the ability of legislators and courts to assess the legality of automated decisions and determine liability for AI-related harm.⁵⁵

Legal Challenges Related to Privacy and Data Protection in the Artificial Intelligence Environment

Artificial intelligence relies heavily on collecting and analyzing large amounts of data, raising significant concerns about privacy and personal data protection. As AI systems increasingly monitor behaviors and analyze personal information through sources such as smart cameras, social media platforms, and mobile applications, questions arise regarding the compatibility of extensive data processing with constitutional privacy rights.⁵⁶ Although many legal systems have updated privacy

⁵² Razan Al-Fakhouri, *Legal Regulation of Artificial Intelligence in Contemporary Legal Systems* (Master's thesis, Yarmouk University, Jordan, 2023).

⁵³ Nuhā Jābir, "The Legislative Gap in the Field of Artificial Intelligence and Its Impact on Civil Liability," *Journal of Legal Studies* 18, no. 2 (2022): 155–180.

⁵⁴ Nūrā al-Zahrānī, "The European Regulation of Artificial Intelligence: An Analytical Reading of the New Legislative Proposal," *Journal of Law and Technology* 9, no. 3 (2021): 201–225.

⁵⁵ Maḥmūd Yāsīn, "Artificial Intelligence and the Principle of Legality in Administrative Law," *Journal of Administrative and Legal Sciences* 7, no. 4 (2020): 112–134.

⁵⁶ Su'ād al-Shāyib, "The Right to Privacy in the Digital Environment: An Analytical Study in Light of Comparative Law," *Journal of Legal Research* 12, no. 1 (2022): 144–167.

laws in response to digital transformation, significant challenges remain in applying traditional data protection principles to AI environments. Some AI systems may collect and reuse personal data without informed consent, potentially violating privacy principles recognized in frameworks such as the EU General Data Protection Regulation (GDPR).⁵⁷ These challenges are intensified by AI systems' reliance on unstructured and open-source data, which complicates the regulation of data processing. Moreover, assigning liability for breaches or unauthorized disclosures is difficult when responsibility is shared among developers, data providers, and users. Therefore, existing legal frameworks must be adapted to address the evolving relationship between AI technologies and individual rights.⁵⁸

First: Artificial Intelligence as a Threat to the Right to Individual Privacy

The right to privacy is a fundamental right recognized in many national constitutions and international instruments, including Article 12 of the Universal Declaration of Human Rights and Article 17 of the International Covenant on Civil and Political Rights, which protect individuals from arbitrary interference with their private life. Similarly, many Arab and foreign constitutions recognize privacy as a protected constitutional right.⁵⁹ However, AI advancements have created new threats to privacy through big data analytics, facial recognition, and behavioral monitoring systems. These technologies may collect sensitive personal information, such as location and personal preferences, without adequate oversight or consent, raising concerns about violations of the informed consent principle established in data protection laws.⁶⁰ The legal challenge is intensified by the absence of clear definitions of personal data and sensitive information in many legal systems. In developing countries, limited supervisory mechanisms and weak regulatory authorities often fail to impose effective obligations on AI developers, increasing the risk of unlawful data use, social manipulation, and insufficient legal remedies.⁶¹ Although frameworks such as the EU General Data Protection Regulation (GDPR) impose strict controls on personal data processing, applying these rules to AI remains legally challenging. The complexity and unpredictability of AI systems make it difficult to determine how

⁵⁷ Manṣūr Khalīfah, "Challenges of Applying the General Data Protection Regulation to Artificial Intelligence Technologies," *Arab Journal of Law and Technology* 7, no. 2 (2021): 98–121.

⁵⁸ Hind Jalāl, "Artificial Intelligence and Human Rights: A Reading of the Data Protection Dilemma," *Journal of Digital Law* 4, no. 3 (2023): 56–82.

⁵⁹ Su'ād al-Shāyib, "The Right to Digital Privacy under International Human Rights Law," *Journal of Law and Legal Studies* 15, no. 2 (2021): 87–110.

⁶⁰ Hudā al-Ṣāwī, "Artificial Intelligence and the Threat to the Right to Privacy in Arab Legislation," *Journal of Legal Studies* 9, no. 1 (2022): 45–72.

⁶¹ Manṣūr Khalīfah, "Challenges of Applying the General Data Protection Regulation to Artificial Intelligence Technologies," *Arab Journal of Law and Technology* 7, no. 2 (2021): 98–121.

data is processed and who bears responsibility, raising questions about the adequacy of traditional privacy laws in protecting privacy rights in AI environments.⁶²

Second: The Ambiguity of the Legal Framework for Personal Data Protection

Personal data are the primary resource driving AI systems, which rely on vast amounts of information to identify patterns and predict behavior. However, the extensive use of data reveals significant gaps in legal frameworks governing its collection, processing, and storage, particularly regarding the protection of privacy and data rights.⁶³ In many Arab countries, personal data protection laws remain absent or inadequate to address AI developments. Existing provisions often fail to accommodate AI-specific features, such as self-learning systems and predictive analytics, creating regulatory uncertainty and difficulties in assigning legal responsibility for violations. Even in jurisdictions with comprehensive data protection frameworks, such as the European Union, challenges remain regarding AI transparency and individuals' ability to understand how their data are processed. The use of "black box" algorithms complicates compliance with disclosure and transparency obligations under the GDPR, particularly Articles 13 and 14.⁶⁴ Furthermore, many legal systems lack specific rules protecting emerging forms of personal data, such as voice records, facial recognition data, and behavioral patterns used in AI applications. This gap limits individuals' control over their information and highlights the need for flexible data protection frameworks capable of adapting to rapid technological change.⁶⁵

Third: The Weakness of Legislative Frameworks Governing Accountability for Artificial Intelligence Systems in Cases of Rights Violations

Holding AI systems accountable for violations of fundamental rights, including privacy, equality, and personal liberty, is a major legal challenge in the digital age. The complexity and opacity of AI technologies make it difficult to determine how legal responsibility should be allocated when harm occurs.⁶⁶ Traditional liability rules require a wrongful act, damage, causation, and attribution to an identifiable actor. Applying this framework to AI is challenging because autonomous systems may

⁶² Mayā Yūsuf, "The Challenges of Applying the GDPR to Artificial Intelligence Technologies: An Analytical Study," *Egyptian Journal of Law and Technology* 6, no. 4 (2022): 65–93.

⁶³ Lailā Ṭāhir, "The Legal Framework for the Protection of Personal Data in Light of Artificial Intelligence," *Journal of Digital Law* 5, no. 2 (2022): 88–112.

⁶⁴ Yūsuf Ṣādiq, "The Legal Gaps in Data Protection Legislation in the Arab World," *Arab Journal of Law and Technology* 7, no. 1 (2021): 43–69.

⁶⁵ Nawal Barakat (2023). *The Compatibility of GDPR with Artificial Intelligence Technologies: An Analytical Study*. *Journal of Contemporary European Law*, 11(1), 101–130.

⁶⁶ Khālid al-Rifā'ī, "Technological Development and the Need for Legislative Adaptation: Non-Traditional Data as a Model," *Arab Journal of Legal and Technological Research* 8, no. 3 (2022): 77–104.

operate without direct human intervention, making it difficult to determine whether responsibility lies with developers, users, or manufacturers. Therefore, some scholars advocate creating a specialized liability regime that reflects the unique characteristics of AI technologies.⁶⁷ Moreover, many Arab legal systems lack specific provisions governing AI-related liability, with concepts such as algorithmic harm and automation-related damage remaining undefined. Even in advanced jurisdictions, including the European Union, debate continues over whether AI liability should be addressed through existing laws or specialized legislation, as proposed by the European Parliament in its 2020 Report on Civil Liability for AI.⁶⁸ This legal uncertainty creates a regulatory gap that limits effective remedies for individuals harmed by AI-based decisions, such as discriminatory employment assessments or unauthorized biometric data processing. Without effective accountability mechanisms, fundamental rights remain vulnerable. Therefore, specialized legal rules are needed to address AI's unique characteristics while balancing technological innovation with rights protection.⁶⁹

Islamic Legal Ethics and the Governance of Artificial Intelligence in Public Administration

Artificial intelligence not only raises questions of legality, accountability, and transparency but also invites broader ethical reflection concerning justice, human dignity, and the public interest. While contemporary legal frameworks primarily regulate AI through administrative law, constitutional principles, and data protection rules, Islamic legal ethics offers an additional normative perspective for assessing whether AI should be adopted in public administration. Rather than focusing solely on legal compliance, Islamic legal ethics evaluates technological innovation according to its contribution to justice, public welfare, and the protection of fundamental human rights.

From the perspective of *Maqāṣid al-Sharīʿah*, technological innovation is not an end in itself but a means of achieving public welfare (*maṣlaḥah*).⁷⁰ Artificial intelligence therefore becomes legally and ethically acceptable when it improves administrative efficiency, strengthens transparency, reduces corruption, and enhances

⁶⁷ Rīm Saʿīd, “Legal Liability Issues for Damages Caused by Artificial Intelligence,” *Journal of Legal and Technological Research* 6, no. 1 (2022): 55–84.

⁶⁸ Sami al-ʿAwwad, “A New Theory of Liability in the Era of Artificial Intelligence,” *Jordanian Journal of Law and Technology*, 4, no. 2 (2021): 99–130.

⁶⁹ Sūhā al-Ṭayyibī, “The European Union and Civil Liability for Artificial Intelligence: An Analytical Reading of the 2020 Parliamentary Report,” *European Law Journal* 12, no. 1 (2023): 45–77.

⁷⁰ Muhammad Safwan Harun et al., “The Concept of Al-Thawābit and Al-Mutaghayyirāt in Technological Innovation According to Maqāṣid Al-Sharīʿah,” *Millab: Journal of Religious Studies*, 2025.

equal access to public services.⁷¹ Conversely, AI systems that produce discriminatory outcomes, arbitrary administrative decisions, or excessive governmental surveillance are inconsistent with the objectives of Islamic law because they threaten justice, privacy, and human dignity. In this respect, Islamic legal ethics complements modern administrative law by emphasizing that governmental innovation should always remain oriented toward the realization of public welfare rather than administrative efficiency alone.

Islamic legal ethics also reinforces the principle of justice (*al-'adl*) as the central foundation of governmental authority.⁷² Administrative decisions generated or supported by artificial intelligence must therefore satisfy not only procedural legality but also substantive fairness. Algorithmic systems should not become instruments that reproduce bias or unequal treatment among citizens. Likewise, the principle of accountability (*mas'uliyah*) requires that public officials remain legally and morally responsible for administrative decisions even when those decisions rely on sophisticated AI technologies.⁷³ The existence of autonomous algorithms cannot eliminate human responsibility because governmental authority ultimately derives from public office rather than technological capability.

Furthermore, the doctrine of *maṣlaḥah* together with the legal maxim *lā ḍarar wa lā ḍirār* (there shall be neither harm nor reciprocal harm) establishes ethical limits on algorithmic governance.⁷⁴ Governments should ensure that artificial intelligence does not compromise constitutional rights, including privacy, equality before the law, due process, and access to effective legal remedies. Consequently, AI governance should incorporate mandatory transparency, explainability, human oversight, and periodic algorithmic auditing as essential legal safeguards. Integrating these principles into administrative governance demonstrates that Islamic legal ethics does not reject technological innovation but instead provides a normative framework through which innovation remains consistent with justice, accountability, and the broader objectives of good governance.

⁷¹ Paul Henman, "Improving Public Services Using Artificial Intelligence: Possibilities, Pitfalls, Governance," *Asia Pacific Journal of Public Administration* 42, no. 4 (2020): 209–21.

⁷² Muhammad Sahibani and Aris Fauzan, "Adl as the Pillar of the Caliphate: A Normative Study of Justice in the Concept of Khalifah," *As-Siyasi: Journal of Constitutional Law* 5, no. 2 (2025).

⁷³ Mohamad Syafiq Bin Abdul Rahim, "Revolutionising The Shariah Secretariat Function Through Artificial Intelligence: Prospects And Challenges For Malaysia's Islamic Banking Sector," *Journal of Central Banking Law and Institutions* 4, no. 3 (2025): 567–94.

⁷⁴ Muhamad Ulul Albab Musaffa, Moh Tamtowi, and Zetty Syarifah, "Neuromarketing in the Perspective of Islamic Business Ethics: Between Innovation and Manipulation," *Jurnal Ilmu Syari'ah Dan Hukum* Vol 57, no. 1 (2023).

CONCLUSION

This study examined the legal implications of integrating artificial intelligence (AI) into public administration from the perspectives of administrative law and Islamic legal ethics, focusing on its impact on the fundamental principles of legality, accountability, transparency, liability, and the protection of individual rights. While AI has significantly enhanced administrative efficiency, evidence-based policymaking, and public service delivery, it has also generated complex legal and ethical challenges that existing regulatory frameworks have yet to address adequately.

The findings demonstrate that the autonomous and adaptive nature of AI challenges traditional legal doctrines concerning administrative discretion, legal liability, and institutional accountability. Algorithmic opacity, limited explainability, fragmented regulatory approaches, and insufficient human oversight continue to undermine transparency, procedural fairness, and public trust in administrative decision-making. Although international initiatives such as the OECD AI Principles, the UNESCO Recommendation on the Ethics of Artificial Intelligence, and the European Union Artificial Intelligence Act provide important normative guidance, they have not yet established a comprehensive and universally applicable legal framework capable of governing AI in public administration.

From the perspective of Islamic legal ethics, the legitimacy of AI should not be assessed solely on the basis of technological capability or administrative efficiency. Rather, its implementation must remain consistent with the ethical principles of justice (*al-'adl*), public welfare (*maṣlaḥah*), accountability (*mas'ulīyyah*), and the prevention of harm (*lā ḍarar wa lā ḍirār*). These principles reinforce contemporary administrative law by ensuring that technological innovation serves the public interest while safeguarding human dignity, constitutional rights, and the rule of law. Accordingly, AI should function as an instrument that supports governmental decision-making rather than replacing human responsibility in the exercise of public authority.

Therefore, this study recommends the adoption of comprehensive legal reforms that integrate enforceable regulatory standards, mandatory transparency and explainability requirements, meaningful human oversight, effective judicial and institutional review mechanisms, and ethical principles derived from both modern administrative law and Islamic legal ethics. Such an integrated framework would strengthen accountable AI governance, enhance public confidence in digital administration, and ensure that technological innovation remains aligned with the objectives of good governance and sustainable public administration.

Future research should further examine comparative models of AI governance, constitutional implications of automated administrative decision-making, and the contribution of Islamic legal ethics to the development of global standards for responsible and human-centered artificial intelligence.

REFERENCES

- Abou El Seoud, Mahinour. "Exploring the Potential of E-Government in Reducing Corruption: Case of Egypt." Master's thesis, American University in Cairo, 2024. <https://fount.aucegypt.edu/etds/2207>.
- Abu Sha'r, Muḥammad. "Civil Liability for Artificial Intelligence in the Context of Civil Law." *An-Najah University Journal for Research (Humanities)* 35, no. 7 (2021): 1403–1430.
- Abū 'Uqayl, Ṭāriq al-Sayyid Maḥmūd. "The Role of Artificial Intelligence Technologies in Combating Cyber Terrorism." Paper presented at the Second International Scientific Conference, Al-Zaytoonah University of Jordan, 2023.
- Al-Awwad, Sami. "A New Theory of Liability in the Era of Artificial Intelligence." *Jordanian Journal of Law and Technology* 4, no. 2 (2021): 99–130.
- Al-Badrān, Aḥmad. "Artificial Intelligence between Governmental Regulation Policies and Self-Regulation: A Theoretical Approach." *Hikama Journal* 4, no. 7 (2023): 93–110. <https://doi.org/10.31430/IJZH4708>.
- Al-Dessouky, Hala. *Legal Liability for Artificial Intelligence in Civil Law*. Master's thesis, Alexandria University, 2022.
- Al-Fakhouri, Razan. *Legal Regulation of Artificial Intelligence in Contemporary Legal Systems*. Master's thesis, Yarmouk University, 2023.
- Al-Hilali, Wafa, and Abdelmajid El Manouar. "Digital Business Models: Doing Business in the Digital Era." In *Innovations in Smart Cities Applications: SCA 2019*, edited by Mohamed Ben Ahmed et al. Cham: Springer, 2020. https://doi.org/10.1007/978-3-030-37629-1_17.
- Al-Kāfī, Ismā'īl 'Abd al-Fattāḥ 'Abd al-Kāfī. *Al-Thawrah al-Raqmiyyah wa al-Dhakā' al-Ṣinā'ī fī al-Qarn al-Ḥādī wa al-'Isbrīn*. Cairo: al-Dār al-Thaqāfiyyah lil-Nashr, 2020.
- Al-Laṭīf, Mahā Yusrī 'Abd. "Legal Liability for the Acts of Robots: An Analytical Study in Light of Civil Law Rules." *Journal of Legal and Economic Research* 75 (2023): 92–110.
- Al-Olama, Omar Sultan. *The Arab Approach to Artificial Intelligence Regulation: Policy and Practice*. Dubai: Arab Center for Digital Policy Studies, 2022.
- Al-Qarnī Amīn Ḥasan, Muḥammad. "Digital Transformation in the Light of Public Interest: A Maqāṣidī and Uṣūlī Study." *Journal of Sharia and Law* 41 (2023): 67–145. <https://doi.org/10.21608/mawq.2023.299427>.
- Al-Rawwāsān, Aḥmad. *Legal Framework for Artificial Intelligence Technologies in Civil Liability*. Master's thesis, Middle East University, 2022.
- Al-Rifā'ī, Khālīd. "Technological Development and the Need for Legislative Adaptation: Non-Traditional Data as a Model." *Arab Journal of Legal and Technological Research* 8, no. 3 (2022): 77–104.
- Al-Rāwī, Suha. "Digital Transformation and the Legislative Gap in the Arab Environment: An Analytical Study." *Arab Journal of Law* 14, no. 1 (2022): 78–104.
- Al-Sayyid Hunaidī, Nādiyah Ibrāhīm. "International Experiences in Applying E-Government and the Challenges of Its Implementation in Arab

- Countries.” *Scientific Journal of the Faculty of Economic and Political Studies* 2, no. 4 (2017): 97–120.
- Al-Shāyib, Su‘ād. “The Right to Privacy in the Digital Environment: An Analytical Study in Light of Comparative Law.” *Journal of Legal Research* 12, no. 1 (2022): 144–167.
- Al-Ṭayyibī, Sūhā Sa‘īd. “The European Union and Civil Liability for Artificial Intelligence: An Analytical Reading of the 2020 Parliamentary Report.” *European Law Journal* 12, no. 1 (2023): 45–77.
- Al-Utaibī, Muḥammad Nāṣir Muḥammad Muṭlaq Duhaym. “Digital Transformation and Its Impact on Public Utilities.” *Journal of Legal and Economic Sciences* 64, no. 2 (2022): 1–48.
- Al-Zahrānī, Nūrā. “The European Regulation of Artificial Intelligence: An Analytical Reading of the New Legislative Proposal.” *Journal of Law and Technology* 9, no. 3 (2021): 201–225.
- Apte, Uday M., Uday S. Karmarkar, and Hiranya K. Nath. “Information Services in the U.S. Economy: Value, Jobs, and Management Implications.” *California Management Review* 50, no. 3 (2008): 12–30. <https://doi.org/10.2307/41166443>.
- Arnūs, Bashīr ‘Alī. *Al-Dbakā’ al-Iṣṭinā’i*. Cairo: Dār al-Saḥāb lil-Nashr wa al-Tawzī‘, 2008.
- Azoulay, Audrey. *Recommendation on the Ethics of Artificial Intelligence*. Paris: UNESCO, 2021. <https://unesdoc.unesco.org/ark:/48223/pf0000381133>.
- Barakat, Nawal. “The Compatibility of GDPR with Artificial Intelligence Technologies: An Analytical Study.” *Journal of Contemporary European Law* 11, no. 1 (2023): 101–130.
- Bouqra, Sufyān. “Civil Liability for Damages Resulting from the Use of Artificial Intelligence: A Comparative Study.” *Journal of Legal and Political Sciences* 12, no. 1 (2021): 223–246.
- Djeffal, Christian. “Artificial Intelligence and Public Governance: Normative Guidelines for Artificial Intelligence in Government and Public Administration.” In *AI and Governance*, 277–290. Springer, 2020. https://doi.org/10.1007/978-3-030-32361-5_12.
- El-Dessouky, Hala. *Legal Liability for Artificial Intelligence in Civil Law*. Alexandria University, 2022.
- El-Hilali, Wafa, and Abdelmajid El Manouar. See Al-Hilali, Wafa.
- European Commission. *Proposal for an Artificial Intelligence Act*. COM(2021) 206 final. Brussels, 2021. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021PC0206>.
- Fandra Mahira, Dararida, Dwi Suci Rohmahwatin, and Nabila Dian Suciningtyas. “Strengthening Multistakeholder Integrated through Shared Responsibility in the Face of Cyber Attacks Threat.” *Lex Scientia Law Review* 4, no. 1 (2020): 59–69. <https://doi.org/10.15294/lesrev.v4i1.38191>.
- Hassan Omar, Hasan H. *AI in Public Administration: The UAE Experience*. Dubai: Emirates Center for Strategic Studies, 2020.
- Harun, Muhammad Safwan, et al. “The Concept of Al-Thawābit and Al-Mutaghayyirāt in Technological Innovation According to Maqāṣid Al-Sharī‘ah.” *Millah: Journal of Religious Studies*, 2025.

- Henman, Paul. "Improving Public Services Using Artificial Intelligence: Possibilities, Pitfalls, Governance." *Asia Pacific Journal of Public Administration* 42, no. 4 (2020): 209–221.
- Jaber, Nahla. "The Legislative Gap in Artificial Intelligence and Its Impact on Civil Liability." *Journal of Legal Studies* 18, no. 2 (2022): 155–180.
- Jobin, Anna, Marcello Ienca, and Effy Vayena. "The Global Landscape of AI Ethics Guidelines." *Nature Machine Intelligence* 1, no. 9 (2019): 389–399. <https://doi.org/10.1038/s42256-019-0088-2>.
- Kaplan, Andreas, and Michael Haenlein. "Siri, Siri, in My Hand: Who's the Fairest in the Land?" *Business Horizons* 62, no. 1 (2019): 15–25. <https://doi.org/10.1016/j.bushor.2018.08.004>.
- Kettani, Dalal, and Fadwa Ammor. "From E-Government to AI Government: Challenges and Opportunities in Developing Countries." 2020.
- Khalifah, Manşūr. "Challenges of Applying the GDPR to Artificial Intelligence Technologies." *Arab Journal of Law and Technology* 7, no. 2 (2021): 98–121.
- Lindner, Felix, Robert Mattmüller, and Bernhard Nebel. "Evaluation of the Moral Permissibility of Action Plans." *Artificial Intelligence* 287 (2020).
- Marjana, Nidhal, and Samah Talhi. "Singapore's Digital Transformation Model: Achievements and Lessons Learned." *Journal of Economic and Financial Research* 11, no. 2 (2024): 305–326. <https://doi.org/10.37164/2056-011-002-014>.
- Montasari, Reza. "Cyber Threats and National Security: The Use and Abuse of Artificial Intelligence." In *Artificial Intelligence and National Security*. Cham: Springer, 2022.
- Musaffa, Muhamad Ulul Albab, Moh Tamtowi, and Zetty Syarifah. "Neuromarketing in the Perspective of Islamic Business Ethics: Between Innovation and Manipulation." *Jurnal Ilmu Syari'ah dan Hukum* 57, no. 1 (2023).
- OECD. *Recommendation of the Council on Artificial Intelligence*. 2019. <https://doi.org/10.1787/685d9a67-en>.
- Rahim, Mohamad Syafiqe Bin Abdul. "Revolutionising the Shariah Secretariat Function Through Artificial Intelligence: Prospects and Challenges for Malaysia's Islamic Banking Sector." *Journal of Central Banking Law and Institutions* 4, no. 3 (2025): 567–594.
- Sahibani, Muhammad, and Aris Fauzan. "Adl as the Pillar of the Caliphate: A Normative Study of Justice in the Concept of Khalifah." *As-Siyasi: Journal of Constitutional Law* 5, no. 2 (2025).
- Scherer, Matthew U. "Regulating Artificial Intelligence Systems." *Harvard Journal of Law & Technology* 29, no. 2 (2016): 353–400. <https://doi.org/10.2139/ssrn.2609777>.
- Thomas, Jennifer. *Legal Governance of Artificial Intelligence in the French Public Sector*. Paris: CNIL Publications, 2020.
- UNESCO. See Azoulay, Audrey.
- Vestager, Margrethe. *Artificial Intelligence Act Proposal*. European Commission, 2021.
- Yūsuf, Mayā. "The Challenges of Applying the GDPR to Artificial Intelligence Technologies." *Egyptian Journal of Law and Technology* 6, no. 4 (2022): 65–93.

- Yāsīn, Muḥammad. "Artificial Intelligence and the Principle of Legality in Administrative Law." *Journal of Administrative and Legal Sciences* 7, no. 4 (2020): 112–134.
- Youssef, Muhammad. *Artificial Intelligence and Digital Transformation in Egyptian Administrative Institutions*. Cairo: National Center for Legal Studies, 2022.
- Mahmood Shaker Abood Alaloosh. Integrating Ricardian contracts with SQL databases: A legal and technical framework for digital commerce in Iraq. *Int J Civ Law Legal Res* 2026;6(2):23-28. DOI: [10.22271/civillaw.2026.v6.i2a.192](https://doi.org/10.22271/civillaw.2026.v6.i2a.192)
- Mahmood Alaloosh, Govar Majed Ahmad, and Lara Adel Jabbar, "Adapting Iraqi Law to Smart Contracts: A Comparative Analysis Incorporating Islamic Law Principles and Consumer Protection in the Contemporary Digital Era," *Metro Islamic Law Review* 5, no. 1 (2026), <https://doi.org/10.32332/milrev.v5i1.13031>.