



## Securing Digital Trade: A Techno-Legal Analysis of E-Commerce Safeguards in Iraq's Regulation No. 4/2025

**Mahmood Shaker Alaloosh<sup>1\*</sup>, Ali Shaker<sup>2</sup>, Sabir Hussien Eliwy<sup>3</sup>**

<sup>1,2</sup>College of Administration and Economics, University of Kirkuk, Iraq

<sup>3</sup>College of Sciences, University of Kirkuk, Iraq

DOI: [doi.org/10.5281/zenodo.18452737](https://doi.org/10.5281/zenodo.18452737)

\*Corresponding Author: [mahmoodshaker@uokirkuk.edu.iq](mailto:mahmoodshaker@uokirkuk.edu.iq)

| Received: 01-10-2025

| Revised: 12-11-2025

| Accepted: 25-01-2026

| Published On: 02-02-2026

**Abstract:** This article evaluates the legal and technical safeguards established under Iraq's 2025 E-Commerce Regulation and assesses their alignment with international regulatory standards amid rapid developments in the digital trade environment. It argues that the regulation provides a potentially robust legal foundation for digital market governance; however, its effectiveness depends on enforcement capacity and adequate technical and administrative infrastructure. Without these conditions, the sector remains vulnerable to fraud, consumer data breaches, and tax avoidance. Methodologically, the study employs doctrinal legal analysis of the regulation and its relationship with existing domestic legislation, particularly consumer protection law. This is complemented by a structured comparative analysis of global data privacy and e-commerce regulatory frameworks, as well as a descriptive-analytical assessment of Iraq's digital trade landscape based on national reports and sectoral data. A techno-legal framework is applied to evaluate safeguards for data security, encryption practices, and digital identity governance. The findings indicate that the regulation introduces key protective mechanisms, including vendor licensing, transparency obligations, personal data protection, tax and customs oversight, and supervisory enforcement powers supported by an electronic licensing platform. These measures show partial convergence with internationally recognized consumer and data protection principles. However, challenges persist, including infrastructural limitations, expansion of informal online trade, and limited technical literacy among stakeholders. Academically, this study contributes to debates on digital regulatory capacity in emerging economies by integrating legal analysis with technical compliance dimensions. It highlights the gap between regulatory design and enforcement readiness, offering a framework for assessing techno-legal governance in today's developing digital markets.

**Keywords:** Consumer Protection; Cybersecurity; Data Privacy; E-commerce; Regulatory Licensing.

## Introduction

The rapid expansion of the digital economy has positioned e-commerce as a central driver of global economic activity, particularly in developing countries seeking to diversify their economies and promote financial inclusion.<sup>1</sup> The shift toward digital trade brings not only opportunities but also complex challenges in legal, technical, and institutional domains.<sup>2</sup> E-commerce inherently involves cross-border transactions, digital data flows, and interactions among multiple stakeholders<sup>3</sup>, creating new risks for consumer protection, data privacy, cybersecurity, tax compliance, and regulatory oversight.<sup>4</sup> Countries worldwide, alongside international organizations, have recognized the need to establish specialized e-commerce frameworks that address these challenges, emphasizing transparency in contracting, data protection, secure payment mechanisms, and clearly defined allocation of responsibilities among digital market participants.<sup>5</sup> For instance, the OECD recommends that consumer trust in e-commerce can be fostered through clear disclosure of supplier identity, transparent contractual terms, secure payment systems, and effective complaint-handling procedures.<sup>6</sup>

Despite these global efforts, e-commerce regulation in developing economies remains underexplored. Research by Norkobilov Akobir (2025) highlights that digital trade in emerging markets often suffers from regulatory fragmentation, insufficient enforcement, and gaps in technical capacity, limiting the effectiveness of legal protections.<sup>7</sup> Similarly, studies by Abdurrahim (2025) in Southeast Asia reveal that while national e-commerce regulations increasingly adopt international best practices, challenges remain in harmonizing technical safeguards such as encryption, digital identity verification, and cross-platform data integration

<sup>1</sup> Amel Asmar Zaboon, Nadia Khutheir Ganawi, and Alaa Abbas Dakhil, 'The Role of E-Commerce Industry in the Sustainable Economic Development of Iraq', *International Journal of Entrepreneurship* 22, no. Specialissue (2018).

<sup>2</sup> Wenju Wang et al., 'E-Commerce for Social Media Platforms: Co-Opetition and Traffic Distribution', *Omega (United Kingdom)* 142 (2026), <https://doi.org/10.1016/j.omega.2026.103524>.

<sup>3</sup> Nuril Aulia Munawaroh et al., 'Digital Empowerment and E-Commerce Adoption among Handicraft SMEs: A Contemporary Islamic Economic Law Study Using the TOE Framework', *MILRev: Metro Islamic Law Review* 4, no. 2 (December 2025): 1427–1448, <https://doi.org/10.32332/milrev.v4i2.11731>.

<sup>4</sup> Mausam Budhathoki et al., 'Market Dynamics and E-Commerce Satisfaction in China's Aquatic Food Sector: Machine Learning and Data Insights', *Aquaculture* 610 (2026), <https://doi.org/10.1016/j.aquaculture.2025.742904>.

<sup>5</sup> Nuzhat Noor Islam Prova et al., 'Multilingual Sentiment Analysis in E-Commerce Customer Reviews Using GPT and Deep Learning-Based Weighted-Ensemble Model', *International Journal of Cognitive Computing in Engineering* 7, no. 1 (2026): 268–286, <https://doi.org/10.1016/j.ijcce.2025.10.003>.

<sup>6</sup> 'OECD Recommendation of the Council on Consumer Protection in E-Commerce. OECD Legal Instruments, No. 336. Paris: Organisation for Economic Co-Operation and Development, 2016 (Rev. 2019)', n.d., accessed 1 February 2026, <https://legalinstruments.oecd.org/public/doc/336/336.en.pdf>.

<sup>7</sup> Norkobilov Akobir, 'Foreign Trade Regulation in the Digital Economy: Challenges and Opportunities and Future Trends: Regulasi Perdagangan Luar Negeri Dalam Ekonomi Digital: Tantangan Dan Peluang Serta Tren Masa Depan', *Academia Open* 10, no. 1 (February 2025): 10.21070/acopen.10.2025.10657-10.21070/acopen.10.2025.10657, <https://doi.org/10.21070/acopen.10.2025.10657>.

with legal requirements.<sup>8</sup> A third study by Chaisse (2025) in the Indo-Pacific region demonstrates that despite the adoption of modern legal frameworks, informal online trade through social media platforms and limited consumer awareness reduce the efficacy of these regulations.<sup>9</sup> Collectively, these studies indicate that while e-commerce legislation is evolving, there is a persistent gap between regulatory design and practical implementation, particularly in developing countries where infrastructure, institutional coordination, and digital literacy are limited.

Iraq, a country with significant economic potential and growing digital adoption, exemplifies these challenges. The enactment of E-Commerce Regulation No. 4 of 2025 represents a concerted effort to provide a coherent legal and technical framework for online commerce.<sup>10</sup> The regulation encompasses licensing of digital vendors, consumer protection, data privacy with mandatory breach notifications, integration with tax and customs systems, supervisory powers, and enforcement mechanisms, while also allowing flexibility in adopting technological solutions.<sup>11</sup> In principle, this comprehensive approach aligns with international trends such as the EU General Data Protection Regulation (GDPR), the Digital Services Act, and OECD recommendations on e-commerce governance and digital taxation. However, the practical effectiveness of these measures depends on the state's capacity to address structural challenges, including insufficient digital infrastructure, overlapping regulatory authority, the prevalence of informal social media-based commerce, and limited technical literacy among small and medium enterprises (SMEs).<sup>12</sup>

The novelty of the present research lies in its techno-legal perspective, integrating legal analysis with an assessment of technical safeguards—a combination often overlooked in prior studies. Unlike Norkobilov Akobir (2025), which focused primarily on legal fragmentation, or Abdurrahim (2025), which emphasized policy alignment with international standards without in-depth technical assessment, this study examines how technical mechanisms such as AES/TLS encryption, blockchain, Self-Sovereign Identity (SSI), and API-based tax integration translate legal requirements into practical compliance solutions. Furthermore, this research extends the work of Chaisse et al. (2025) by contextualizing regulatory implementation within Iraq's unique socio-economic and digital infrastructure landscape and by addressing local

<sup>8</sup> Abdurrahim, 'Transforming Trade Law in the Digital Era: Navigating Challenges and Seizing Opportunities for Legal Reforms in Indonesia's Evolving Trade Landscape', *Ex Aequo Et Bono Journal Of Law* 2, no. 2 (January 2025): 108–121, <https://doi.org/10.61511/eaebjol.v2i2.2025.1338>.

<sup>9</sup> Julien Chaisse, Georgios Dimitropoulos, and Irma Mosquera, 'Law and Digital Transformation in the Indo-Pacific: An International Economic Law Perspective', *The Journal of World Investment & Trade* 26, no. 4 (June 2025): 575–620, <https://doi.org/10.1163/22119000-12340376>.

<sup>10</sup> 'Commercial Contracts 2025 - Iraq | Global Practice Guides | Chambers and Partners', accessed 1 February 2026, <https://practiceguides.chambers.com/practice-guides/commercial-contracts-2025/iraq/trends-and-developments/O23676>.

<sup>11</sup> Mustafa Alawi et al., 'The Determinants of E-Commerce Quality on Small Business Performance in Iraq Case Study from Ceramic Industry', *Journal of Advanced Research in Dynamical and Control Systems* 10, no. 2 Special Issue (2018): 1348–1360.

<sup>12</sup> Ahmed Hasan Shakir, Kadhim Ghaffar Kadhim, Amjed Hameed Majeed, Hasan Majdi, et al., 'Towards Alleviating Poverty: Study The Impact of E-Commerce, Digital Marketing, and Digitalization's on Improving Economic Growth in Iraq', *AgBioForum* 27, no. 1 (2025): 49–57.

constraints that affect enforcement and compliance. By linking legal mandates with technical realities, this study provides an integrated framework for understanding and enhancing the efficacy of e-commerce regulation in developing economies.

Despite the breadth of existing literature on digital trade governance, a significant research gap remains regarding the interaction between regulatory design, technical safeguards, and local contextual factors in countries like Iraq. Most studies either analyze legal frameworks in isolation or evaluate technical systems without examining their enforceability within national regulatory environments. There is limited doctrinal and comparative research exploring how these factors collectively influence consumer trust, market formalization, and the integration of e-commerce into the national economy. This gap underscores the need for studies that combine doctrinal analysis, comparative evaluation with international standards, and technolegal assessment to develop actionable insights for policymakers. Accordingly, this research addresses the following central question: To what extent does Iraq's E-Commerce Regulation No. 4 of 2025 provide adequate legal and technical safeguards for e-commerce actors, and how can its implementation be enhanced to align with international best practices while accommodating local constraints? This question guides the analysis of licensing procedures, consumer protection measures, data privacy safeguards, integration with tax and customs systems, enforcement mechanisms, and the translation of legal provisions into technical compliance measures.

The significance of this study is multifaceted. Academically, it contributes to the literature on digital governance by providing a holistic techno-legal analysis of e-commerce regulation in a developing country context—a perspective rarely addressed comprehensively. It offers a novel framework for evaluating the interplay between legal mandates and technical safeguards, highlighting how integration can strengthen regulatory effectiveness, improve consumer confidence, and reduce risks of fraud, data breaches, and tax evasion. From a policy perspective, the findings can inform legislators, regulatory authorities, and digital platform operators about critical enablers and barriers to effective regulation. By identifying gaps in infrastructure, institutional coordination, and technical capacity, the study provides actionable recommendations to improve the implementation of e-commerce law, including digital licensing systems, merchant capacity-building, inter-agency coordination, digital identity frameworks, and continuous monitoring. Ultimately, the study aims to support the transformation of Iraq's e-commerce sector into a secure, trustworthy, and integrated component of the formal economy, contributing to national economic development and aligning local practices with global digital governance standards.

## Method

This study employs a doctrinal and comparative approach with a techno-legal perspective<sup>13</sup>, allowing a comprehensive analysis of Iraq's E-Commerce Regulation No. 4 of 2025 from both legal and technical dimensions. The doctrinal approach is used to systematically examine the regulation's provisions, including vendor licensing, consumer protection, data security, integration with tax and customs systems, and oversight and sanction mechanisms. Meanwhile, the comparative approach evaluates the Iraqi regulation against international standards and best practices from other jurisdictions, such as the GDPR, the Digital Services

---

<sup>13</sup> Matthew B Miles and A. Michael Huberman, *Analisis Data Kualitatif: Buku Sumber Tentang Metode-Metode Baru* (Jakarta: Universitas Indonesia Press, 2014).

Act, and OECD recommendations on consumer protection, data privacy, and digital taxation. By combining these approaches, the study not only maps the regulation's content but also assesses the alignment between national policy and global standards, as well as the practical implications for legal certainty, technical compliance, and consumer trust in the e-commerce ecosystem.

The study relies exclusively on secondary data sources, including official legal documents, government reports, academic publications, international guidelines, and relevant research from open-access and institutional datasets. Data analysis is conducted using a descriptive-analytical approach, interpreting regulatory provisions in the context of domestic law and international comparisons, and examining the integration of technical measures, such as digital licensing systems, data encryption, blockchain, and Self-Sovereign Identity (SSI), to support regulatory compliance. To ensure data validity and reliability, the study applies document triangulation, cross-verifying regulatory findings with international legal literature, UNCTAD reports, and global technical standards. This approach ensures that the interpretation of the regulation is not only normative but also considers technical feasibility in accordance with international best practices and the local context of Iraq.

## Results and Discussion

This study explores the effectiveness of E-Commerce Regulation No. 4 of 2025 in Iraq in providing legal and technical safeguards for e-commerce actors. The analysis focuses on legal aspects, consumer protection, data security, tax and customs integration, and supervisory and sanction mechanisms.

### Legal Guarantees under Iraq's E-Commerce Regulation No. 4 of 2025

The Iraqi E-Commerce Regulation No. 4 of 2025 establishes a comprehensive framework of legal and technical safeguards designed to structure the digital marketplace, protect consumers, and ensure state oversight of online commercial activity. Rather than functioning as a mere administrative instrument, the regulation constructs an integrated system of licensing, consumer protection, data governance, fiscal coordination, and supervisory enforcement. Together, these elements form the backbone of legal certainty in Iraq's emerging digital economy. A central pillar of this framework is mandatory licensing and regulatory supervision. Article (6) prohibits any person or company from conducting e-commerce activities in Iraq without obtaining a license from the Ministry of Commerce and completing approvals from competent authorities. Article (4) further requires the Ministry to establish a fully digital platform for completing licensing and renewal procedures online. This digitalization of licensing is not merely procedural convenience; it links legal authorization with technological infrastructure. By maintaining an official registry of licensed traders, the Ministry can monitor market actors, verify compliance with legal standards, and intervene when violations occur. Licensing thus functions as a preventive legal guarantee, promoting transparency, traceability, and accountability in an otherwise borderless digital environment. It also strengthens consumer trust by signaling that market participants operate under recognized legal status and regulatory oversight.<sup>14</sup>

---

<sup>14</sup> Ali Kamel Baaiwi et al., 'The reality of e-commerce and digital marketing in the Iraqi market: opportunities and challenges', *Al-Ghary Journal of Economic and Administrative Sciences* (Kufa) 20, no. 00 (July 2024): 289–305, <https://doi.org/10.36325/ghjec.v20i00.16779>.

Complementing this structural control is a robust emphasis on consumer protection and transparency. The regulation obliges traders to disclose essential pre-contractual information, including identity, licensing status, product or service descriptions, payment methods, and return or cancellation policies. Such disclosure addresses the inherent imbalance of information between professional sellers and consumers, who are often the weaker party in digital transactions. By mandating explicit and prior information, the law reduces risks of fraud, misleading advertising, and contractual ambiguity.<sup>15</sup> Transparency extends beyond product details to include privacy practices, requiring merchants to inform consumers how their personal data will be collected, stored, shared, and protected. These obligations align with broader principles of fairness and good faith in commercial dealings, reinforcing ethical standards in digital trade. At the national level, this framework operates alongside Iraq's Consumer Protection Law No. 1 of 2010, allowing institutions such as the Consumer Protection Council to oversee online advertising and enforce truthful disclosure, particularly on social media platforms where misleading promotions are prevalent.<sup>16</sup>

The regulation also advances data privacy and breach notification as a core legal guarantee. E-commerce traders must implement secure systems to protect personal data, collect only necessary information, and obtain explicit consent before sharing data with third parties. Notably, the law introduces a breach-notification duty: in the event of a security incident, merchants must promptly inform affected consumers and relevant authorities, specifying the nature of the breach and corrective measures taken.<sup>17</sup> This requirement transforms data protection from a passive obligation into an active accountability regime. It encourages the adoption of encryption technologies, access controls, incident response procedures, and monitoring systems, such as intrusion detection systems. By embedding legal responsibility for data security, the regulation supports the recognition of personal data protection as a fundamental right and aligns Iraq with global trends in digital governance. The existence of formal breach-response mechanisms also enhances consumer confidence, particularly in contexts where skepticism toward online data sharing remains high.

Another significant dimension is tax and customs integration, which connects digital commerce to the formal economic system. Articles 25 and 26 require coordination between the Ministry of Commerce, the General Customs Authority, and the General Tax Authority. Goods traded through e-commerce platforms must be subject to customs procedures, while digital merchants are expected to fulfill tax obligations comparable to those of traditional businesses. This integration serves multiple objectives: preventing tax evasion, ensuring fiscal fairness, and generating public revenue from digital economic activity. It also reduces regulatory asymmetry between online and offline commerce, creating a level playing field. International

<sup>15</sup> Musmualim Musmualim, Fokky Fuad, and Suartini Suartini, 'Legal Protection for Consumers in Transactions E-Commerce by Era Digital', *Eduvest - Journal of Universal Studies* 4, no. 12 (December 2024): 11935–11943, <https://doi.org/10.59188/eduvest.v4i12.33413>.

<sup>16</sup> Zainal Amin Ayub, 'The Legal Challenges of International Electronic Contracts in Iraq', *International Journal of Social Science Research* 5, no. 2 (September 2017): 57–72, <https://doi.org/10.5296/ijssr.v5i2.11332>.

<sup>17</sup> Ansam Khraisat and Ammar Alazab, 'A Critical Review of Intrusion Detection Systems in the Internet of Things: Techniques, Deployment Strategy, Validation Strategy, Attacks, Public Datasets and Challenges', *Cybersecurity* 4, no. 1 (March 2021): 18, <https://doi.org/10.1186/s42400-021-00077-7>.

practice supports this approach, particularly regarding the role of digital platforms in facilitating data sharing and tax collection. However, effective implementation depends on the development of digital infrastructure, interoperable information systems, and simplified guidance for small and emerging merchants, who may otherwise remain outside the formal system.<sup>18</sup>

To clarify how these legal and technical safeguards operate in an integrated manner, the core guarantees embedded in the regulation can be systematized across several interrelated dimensions. Each dimension reflects a specific regulatory objective, links normative obligations with institutional functions, and produces distinct impacts on market order, consumer protection, and state oversight. The following table synthesizes these elements to illustrate how Iraq's E-Commerce Regulation No. 4 of 2025 constructs a layered architecture of legal certainty in the digital marketplace.

Table 1. Core Legal Guarantees in Iraq's E-Commerce Regulation No. 4 of 2025

Dimension	Legal Basis	Key Obligations	Regulatory Purpose	Expected Impact
Licensing & Supervision	Arts. 4 & 6	Mandatory license via digital platform; official registry	Market traceability and state oversight	Increased transparency and trader accountability
Consumer Protection & Transparency	Disclosure provisions + Consumer Protection Law 2010	Identity, product info, payment terms, return policies, privacy notice	Reduce information asymmetry and fraud	More substantial consumer confidence and legal clarity
Data Privacy & Breach Notification	Data security and consent rules	Secure systems, limited data collection, breach reporting	Protect personal data and ensure accountability	Higher trust in digital transactions
Tax & Customs Integration	Arts. 25–26	Coordination with tax and customs authorities	Prevent evasion; formalize the digital economy	Fiscal fairness and revenue generation
Supervisory Authority & Sanctions	Enforcement provisions	Monitoring, suspension,	Ensure compliance	More credible and disciplined

<sup>18</sup> Mohammad Ali Abdulhasan Yassin et al., 'Examination of the Status of Privacy in the Legal Systems of Iran and Iraq', *Interdisciplinary Studies in Society, Law, and Politics* 3, no. 3 (July 2024): 75–88, <https://doi.org/10.61838/kman.isslp.3.3.10>.

and revocation of licenses	and deter violations	e-commerce environment
-------------------------------	-------------------------	---------------------------

Source: Author's Interpretation

The table demonstrates that Iraq's E-Commerce Regulation No. 4 of 2025 builds legal certainty through a set of interdependent safeguards that collectively structure the digital market. Licensing and supervisory mechanisms establish the formal entry point into the e-commerce ecosystem, ensuring trader traceability and enabling state oversight. Consumer protection and transparency rules address the informational imbalance inherent in online transactions by obliging merchants to disclose clear contractual and identity-related information, thereby strengthening trust and reducing fraud risks. Data privacy and breach-notification duties extend this protection into the technological sphere, transforming data security into a legal responsibility and reinforcing consumer confidence in digital interactions. Tax and customs integration situates e-commerce within the formal tax system, promoting fairness between digital and conventional trade while enhancing the state's revenue capacity. Finally, supervisory authority and sanctions provide the enforcement backbone of the framework, signaling that compliance is a continuing obligation and that violations carry meaningful consequences. Taken together, these dimensions reveal a regulatory model that does not rely on a single protective tool but instead combines legal authorization, transparency, technological security, fiscal coordination, and enforcement power to create a structured and accountable digital commerce environment.

### Technical Safeguards in Iraq's E-Commerce Regulation No. 4 of 2025

Beyond its legal architecture, Iraq's E-Commerce Regulation No. 4 of 2025 is supported by a set of technical safeguards that translate regulatory goals into operational digital systems.<sup>19</sup> These safeguards ensure that licensing, data protection, supervision, and fiscal compliance are not merely legal obligations on paper but are embedded in technological infrastructures that support secure and accountable digital trade. The regulation, therefore, reflects a governance model in which law and technology function as mutually reinforcing instruments. A foundational element is the digital licensing platform operated by the Ministry of Commerce. This centralized electronic system enables merchants to apply for, renew, and update licenses while allowing authorities to track trader status in real time. By digitizing licensing, the regulation links legal authorization to an auditable technological process, improving transparency and administrative efficiency. Advanced architectures, such as blockchain-based registries, may further strengthen this system by creating tamper-resistant, immutable licensing records. Distributed ledgers enhance traceability and preserve historical data for regulatory or judicial review.

Equally important is integrating secure digital identity frameworks into the licensing platform.<sup>20</sup> Self-Sovereign Identity (SSI) models offer a privacy-preserving method for verifying merchants, enabling them to control their identity data while disclosing only necessary attributes through encrypted credentials and digital signatures. Such systems reduce risks of

<sup>19</sup> 'Commercial Contracts 2025 - Iraq | Global Practice Guides | Chambers and Partners', accessed 1 February 2026, <https://practiceguides.chambers.com/practice-guides/commercial-contracts-2025/iraq/trends-and-developments/O23676>.

<sup>20</sup> Khraisat and Alazab, 'A Critical Review of Intrusion Detection Systems in the Internet of Things'.

impersonation and identity theft while supporting compliance with data-minimization principles. Combined with Public Key Infrastructure (PKI) and digital certificates, these tools ensure authentication, integrity, and non-repudiation of transactions, thereby strengthening the evidentiary value of digital records. Hybrid decentralized system designs—where oversight functions are distributed but administrative interfaces remain accessible—also improve resilience against system failure or cyberattacks. A second safeguard concerns data security and encryption standards. The regulation requires merchants to implement “secure systems” for protecting consumer information, establishing a flexible yet mandatory baseline for cybersecurity. In practice, this involves encrypting data in transit and at rest through protocols such as TLS and strong algorithms like AES-256. Hybrid cryptographic models that combine symmetric encryption for efficiency with asymmetric encryption for secure key exchange provide balanced protection.<sup>21</sup> These technical measures prevent interception, unauthorized alteration, or data leakage, particularly for payment and identity information. The law’s technology-neutral stance allows merchants to adopt evolving security solutions while enabling regulators to evaluate compliance through security audits and policy reviews.

Closely related is the development of security incident-reporting mechanisms. The regulation envisions systems capable of detecting, documenting, and responding to breaches. Merchants must therefore maintain access logs, intrusion detection systems (IDSs), and incident response protocols. Advanced analytical models, including machine-learning-based anomaly detection, can enhance early identification of threats. Security Information and Event Management (SIEM) tools aggregate logs from multiple sources and generate alerts, enabling systematic documentation and rapid communication with authorities. These mechanisms transform breach reporting from a reactive duty into a proactive security culture, minimizing damage and improving institutional learning from incidents. Technical safeguards also support integration with tax and customs systems. Application Programming Interfaces (APIs) enable automated, secure data exchange between e-commerce platforms and government authorities. Through encrypted and authenticated connections, platforms can transmit transaction data, invoices, and shipping details without compromising privacy.<sup>22</sup> This integration reduces tax evasion, facilitates customs clearance, and enhances regulatory transparency. International experience demonstrates that API-based systems enable real-time monitoring and dynamic tax rate updates. For Iraq, the effectiveness of this mechanism depends on secure API management, robust access controls, and interoperability among digital systems.

To illustrate how these technological components operate as an integrated protection system rather than isolated tools, the main technical safeguards embedded in the regulation can be organized into several functional dimensions. Each dimension connects specific technologies with regulatory purposes, security outcomes, and governance effects. The following table summarizes this structure, showing how technical design directly supports legal compliance, institutional oversight, and trust in Iraq’s digital commerce environment.

<sup>21</sup> Alaa Al-Heali, ‘The Role of Electronic Marketing in Promoting the Products of the National Industry in Iraq: The Role of Electronic Marketing in Promoting the Products of the National Industry in Iraq’, *Iraqi Journal of Market Research and Consumer Protection* 14, no. (1) (June 2022): 1–14.

<sup>22</sup> Shiqiang Wang et al., ‘Security Risks and Regulation of Cross-Border e-Commerce in Digital Economy’, *Journal of Electronic Business & Digital Economics* 4, no. 2 (November 2025): 385–401, <https://doi.org/10.1108/JEBDE-12-2024-0053>.

Table 2. Technical Safeguards Supporting E-Commerce Regulation No. 4 of 2025

Technical Dimension	Core Technologies	Regulatory Function	Security Contribution	Governance Impact
Digital Licensing Platform	Centralized portal, distributed ledger options	Manage licensing lifecycle and trader registry	Tamper-resistant and auditable records	Transparent oversight and market traceability
Digital Identity Systems	SSI, PKI, digital certificates, e-signatures	Merchant authentication and verification	Prevent impersonation and ensure integrity	Stronger legal validity of digital transactions
Data Security & Encryption	TLS, advanced cryptographic standards	Protect stored and transmitted data	Confidentiality and integrity of personal/payment data	Compliance with secure-system requirements
Incident Detection & Reporting	IDS, SIEM, log monitoring, anomaly detection	Early breach detection and formal reporting	Rapid response and minimized damage	Institutional accountability and digital trust
Tax & Customs Integration	Secure APIs, encrypted data exchange	Transaction reporting and fiscal coordination	Reduced manipulation of trade data	Improved revenue monitoring and regulatory fairness

Source: Author's Interpretation

The table shows that the technical framework supporting Iraq's E-Commerce Regulation No. 4 of 2025 is built as a coordinated system in which each technological layer serves a distinct regulatory and security function. The digital licensing platform serves as the primary entry point, providing an auditable registry that enhances market traceability and transparent oversight. Digital identity systems then reinforce this structure by ensuring reliable merchant authentication through secure credentials and electronic signatures, thereby strengthening the legal validity and integrity of online transactions. Data security and encryption measures operate at the protective core of the system, safeguarding personal and payment information and ensuring compliance with the regulation's requirement for "secure systems." Incident detection and reporting tools add a resilience dimension, enabling early threat identification and structured responses that reduce damage and support institutional accountability. Finally, integration with tax and customs systems extends technical governance into the fiscal domain, allowing transaction data to support fair taxation and regulatory monitoring. Together, these elements demonstrate that technical safeguards are not peripheral additions but constitute the operational backbone of digital commerce governance, linking security, transparency, and state oversight within a single, interdependent framework.

### Implementation Challenges and Strategic Responses

While Iraq's E-Commerce Regulation No. 4 of 2025 establishes a robust system of legal and technical safeguards, its practical effectiveness depends on institutional capacity, technological readiness, and market adaptation. Like many regulatory reforms in emerging digital economies, the transition from normative design to operational enforcement presents structural and implementation challenges that may affect the regulation's impact in its early stages.<sup>23</sup> One of the most fundamental constraints lies in the limited digital infrastructure. Although internet penetration in Iraq continues to grow, disparities in connection speed, network stability, and service coverage remain evident, particularly outside major urban centers. E-commerce regulation increasingly relies on stable digital connectivity for licensing procedures, real-time supervision, secure transactions, and data exchange with state systems. Weak infrastructure, therefore, risks creating unequal compliance conditions: merchants in well-connected areas can adopt digital licensing and security systems more easily, while those in poorly served regions may struggle to meet technical requirements. This imbalance can slow the universal application of regulatory standards and may unintentionally push some traders toward informal digital practices rather than formal compliance. Strengthening broadband infrastructure and ensuring reliable connectivity thus becomes not only a development priority but a regulatory necessity.

A second challenge concerns overlapping regulatory authority. The regulation requires coordination among the Ministry of Commerce, tax authorities, and customs bodies, particularly regarding transaction reporting and fiscal obligations. However, without clearly defined operational boundaries and communication protocols, institutional duplication may occur. Delays in data sharing, inconsistent interpretations of obligations, or fragmented enforcement strategies could weaken regulatory coherence. Effective e-commerce governance depends on seamless inter-agency collaboration, as digital transactions do not align neatly with traditional bureaucratic divisions. Establishing formal coordination mechanisms—such as joint steering committees or shared digital dashboards—would help prevent regulatory fragmentation and ensure that supervision, taxation, and customs procedures function as parts of a unified system.<sup>24</sup>

Another significant issue arises from the prevalence of e-commerce conducted through social media platforms.<sup>25</sup> A large share of online trade in Iraq occurs through informal channels such as Facebook and Instagram accounts that operate outside structured e-commerce platforms.<sup>26</sup> These sellers may not hold formal licenses, and transactions often occur via direct messaging or cash on delivery. This environment complicates enforcement of licensing, disclosure, and data-protection requirements. The informal nature of social media commerce

<sup>23</sup> Ako Abubakr Jaffar, Mazen Ismaeel Ghareb, and Karzan Hussein Sharif, 'The Challenges of Implementing E-Commerce in Kurdistan of Iraq', *Journal of University of Human Development* 2, no. 3 (August 2016): 528–533, <https://doi.org/10.21928/juhd.v2n3y2016.pp528-533>.

<sup>24</sup> Ahmed Hasan Shakir et al., 'The Impact of E-Commerce, Digital Marketing, and Digitalization on Firm's Growth in Iraq', *AGBIOFORUM* 26, no. 3 (2024): 74–82.

<sup>25</sup> Dwi Edi Wibowo, 'Consumer Protection in the Digital Era: Challenges and Solutions from an Islamic Legal Perspective', *Jurnal Ilmiah Mizani: Wacana Hukum, Ekonomi Dan Keagamaan* 11, no. 2 (October 2024): 473–485, <https://doi.org/10.29300/mzn.v11i2.4752>.

<sup>26</sup> Ismawati and Suud Sarim Karimullah, 'Consumer Protection in the Digital Era: An Analysis of Consumer Protection in E-Commerce', *NUSANTARA: Journal Of Law Studies* 3, no. 02 (December 2024): 68–80, <https://doi.org/10.5281/zenodo.17376951>.

can undermine consumer safeguards and reduce the capacity of state oversight. Rather than pursuing strict prohibition, a more realistic strategy involves gradual integration: simplified licensing pathways for small social sellers, cooperation with platforms to verify licensed merchants, and awareness campaigns that emphasize the legal and commercial advantages of formalization.<sup>27</sup>

The operational readiness of the digital licensing platform also presents a transitional challenge. Although the regulation mandates an electronic licensing system, the effectiveness of this safeguard depends on the platform's technical maturity, user-friendliness, and cybersecurity robustness. Delays in full deployment or system instability could turn a core regulatory mechanism into a procedural bottleneck.<sup>28</sup> Early-stage digital government systems often face issues related to scalability, interoperability, and user adaptation. Continuous technical support, phased implementation, and feedback loops with merchants are therefore essential to transform the platform into a functional regulatory instrument rather than a symbolic provision.<sup>29</sup>

A further constraint is the limited cybersecurity expertise among merchants, tiny and medium-sized enterprises. Advanced requirements such as encryption, intrusion detection, and incident reporting demand technical knowledge and financial resources that many small traders lack. Without support, these actors may either fail to comply or adopt superficial measures that do not provide absolute protection.<sup>30</sup> This gap risks creating a formal compliance culture without substantive cybersecurity resilience. Targeted capacity-building initiatives—such as training programs, technical guidelines, and financial incentives—can help bridge this divide and ensure that legal obligations translate into effective security practices. Addressing these challenges requires a coordinated strategic response. Institutional capacity-building is crucial, including the establishment of specialized cybersecurity units within the Ministry of Commerce capable of setting standards, providing technical assistance, and monitoring compliance.<sup>31</sup> Rapid but carefully managed deployment of the digital licensing platform, supported by help desks and user guidance, can build trust in the system. Inter-agency cooperation should be formalized through structured data-sharing agreements and joint operational bodies to ensure coherent oversight.

---

<sup>27</sup> Lara Adel Jabbar Al-Zandi and Saeed Youssef Al-Bustani, 'The Legal Conditions Of Electronic Arbitration In Electronic Commerce Contracts: A Comparative Study Between Iraqi And Lebanese Legislations', *Perdana: International Journal of Academic Research* 21, no. 1 (November 2024): 36–67.

<sup>28</sup> Mohanad Hamad Ahmed Al-Jubori, 'Formation of Electronic Contracts of Sale and Its Impact on Iraqi Traditional Commercial Contracts', 2018.

<sup>29</sup> Ahmed Hasan Shakir, Kadhim Ghaffar Kadhim, Amjed Hameed Majeed, Prof Dr Hasan Majdi, et al., 'Towards Alleviating Poverty: Study The Impact of E-Commerce, Digital Marketing, and Digitalization's on Improving Economic Growth in Iraq', *AGBIOFORUM* 27, no. 1 (June 2025): 49–57.

<sup>30</sup> Ibrahim T. Nather and M. A. Burhanuddin, 'Determining the Impact Factors of E-Commerce Adoption by Smes in Iraq: An Overview', SSRN Scholarly Paper no. 3930578 (Rochester, NY: Social Science Research Network, 2018), <https://papers.ssrn.com/abstract=3930578>.

<sup>31</sup> Ammar Alhusseini, 'Digital Challenges and the Impact of Information Crimes on Competition and Monopoly Prevention Policies in Iraq', *Enterpreneurship Journal For Finance and Business*, 2 July 2025, 25–35, <https://doi.org/10.56967/ejfb2025622>.

Equally important is the integration of informal digital actors. Streamlined licensing processes and collaboration with social media platforms to highlight verified sellers can gradually bring informal traders into the regulatory sphere. Parallel awareness campaigns should inform both consumers and merchants about rights, obligations, and the benefits of formal participation in the digital economy. Long-term sustainability also depends on the development of a national digital identity infrastructure that supports secure authentication and electronic signatures, enhancing the credibility of transactions across sectors.

## Conclusion

Iraq's E-Commerce Regulation No. 4 of 2025 provides a comprehensive legal and technical framework to regulate online sellers, prevent consumer fraud, and ensure the security of digital data. The regulation addresses key legal areas, including licensing, data protection, cybersecurity, and coordination with tax and customs authorities, while allowing flexibility in selecting technological solutions. Nevertheless, its implementation faces several challenges that may limit effectiveness, such as insufficient digital infrastructure, overlapping regulatory authorities, the expansion of informal social media-based trade, and limited cybersecurity expertise among business actors. Measures such as strengthening digital licensing systems, enhancing merchant capacity, improving inter-agency coordination, implementing digital identity frameworks, and conducting continuous monitoring and evaluation can help increase compliance and the overall effectiveness of the regulation. Overall, if properly implemented, the regulation has the potential to transform Iraq's e-commerce sector into a secure, trustworthy, and fully integrated component of the formal economy, enhancing legal certainty, boosting consumer confidence, and supporting national digital development. For future research, it is recommended to conduct empirical studies assessing the regulation's effectiveness in practice, including measuring merchant compliance, evaluating the impact of data protection on consumer behavior, and analyzing the preparedness of relevant institutions. Further studies could also examine how integrating emerging technologies, such as digital identity systems and electronic licensing platforms, enhances the security, efficiency, and governance of Iraq's e-commerce sector.

## Acknowledgement

The authors would like to express their sincere gratitude to the leadership of the College of Administration and Economics at the University of Kirkuk, Kirkuk, Iraq, for their institutional support and encouragement throughout this research. Appreciation is also extended to all members of the College's academic community for providing a constructive scholarly environment that contributed to the successful completion of this study.

## Author Contributions Statement

Mahmood Shaker Alaloosh conceptualized the study, developed the research design, and led the legal and doctrinal analysis. Ali Shaker contributed to the comparative regulatory analysis, data collection, and interpretation of international data-protection and e-commerce frameworks. Sabir Hussien Eliwy was responsible for the techno-legal assessment, the analysis of technical safeguards, and the drafting of sections on digital security and compliance mechanisms. All authors contributed to writing, reviewing, and editing the manuscript and approved the final version for publication.

## AI Usage Statement

The authors declare that artificial intelligence (AI) tools were used in a limited capacity to assist with language editing, grammar refinement, and improvement of academic writing clarity. AI was not used to generate research data, conduct analysis, interpret legal materials, or develop the study's arguments and conclusions. All substantive intellectual contributions, including conceptualization, legal analysis, comparative assessment, and interpretation of findings, were carried out solely by the authors. The authors take full responsibility for the content, accuracy, and originality of this work.

## Conflict of Interest

The authors declare that there are no conflicts of interest regarding the publication of this research. The study was conducted without any commercial or financial relationships that could be construed as a potential conflict of interest.

## References

- Abdurrahim. 'Transforming Trade Law in the Digital Era: Navigating Challenges and Seizing Opportunities for Legal Reforms in Indonesia's Evolving Trade Landscape'. *Ex Aequo Et Bono Journal Of Law* 2, no. 2 (January 2025): 108–121. <https://doi.org/10.61511/eaebjol.v2i2.2025.1338>.
- Akobir, Norkobilov. 'Foreign Trade Regulation in the Digital Economy: Challenges and Opportunities and Future Trends: Regulasi Perdagangan Luar Negeri Dalam Ekonomi Digital: Tantangan Dan Peluang Serta Tren Masa Depan'. *Academia Open* 10, no. 1 (February 2025): 10.21070/acopen.10.2025.10657-10.21070/acopen.10.2025.10657. <https://doi.org/10.21070/acopen.10.2025.10657>.
- Alawi, Mustafa, Nurulizwa Rashid, Samer Ali Al-Shami, and H.A. Al-Lamy. 'The Determinants of E-Commerce Quality on Small Business Performance in Iraq Case Study from Ceramic Industry'. *Journal of Advanced Research in Dynamical and Control Systems* 10, no. 2 Special Issue (2018): 1348–1360.
- Al-Heali, Alaa. 'The Role of Electronic Marketing in Promoting the Products of the National Industry in Iraq: The Role of Electronic Marketing in Promoting the Products of the National Industry in Iraq'. *Iraqi Journal of Market Research and Consumer Protection* 14, no. (1) (June 2022): 1–14.
- Alhusseini, Ammar. 'Digital Challenges and the Impact of Information Crimes on Competition and Monopoly Prevention Policies in Iraq'. *Enterprenuership Journal For Finance and Bussiness*, 2 July 2025, 25–35. <https://doi.org/10.56967/ejfb2025622>.
- Al-Jubori, Mohanad Hamad Ahmed. 'Formation of Electronic Contracts of Sale and Its Impact on Iraqi Traditional Commercial Contracts'. 2018.

- Al-Zandi, Lara Adel Jabbar, and Saeed Youssef Al-Bustani. 'The Legal Conditions Of Electronic Arbitration In Electronic Commerce Contracts: A Comparative Study Between Iraqi And Lebanese Legislations': *Perdana: International Journal of Academic Research* 21, no. 1 (November 2024): 36–67.
- Ayub, Zainal Amin. 'The Legal Challenges of International Electronic Contracts in Iraq'. *International Journal of Social Science Research* 5, no. 2 (September 2017): 57–72. <https://doi.org/10.5296/ijssr.v5i2.11332>.
- Baiwi, Ali Kamel, Hassan Abdullah Ahmed, Zahraa Saad Abdulaali, and Heider Nima Bekheet. 'The reality of e-commerce and digital marketing in the Iraqi market:opportunities and challenges'. *Al-Ghary Journal of Economic and Administrative Sciences* (Kufa) 20, no. 00 (July 2024): 289–305. <https://doi.org/10.36325/ghjec.v20i00.16779>.
- Budhathoki, Mausam, Lincen Li, Hao Xu, Wenbo Zhang, Xuzhou Ma, Sujita Pandey, and Marianne Thomsen. 'Market Dynamics and E-Commerce Satisfaction in China's Aquatic Food Sector: Machine Learning and Data Insights'. *Aquaculture* 610 (2026). <https://doi.org/10.1016/j.aquaculture.2025.742904>.
- Chaisse, Julien, Georgios Dimitropoulos, and Irma Mosquera. 'Law and Digital Transformation in the Indo-Pacific: An International Economic Law Perspective'. *The Journal of World Investment & Trade* 26, no. 4 (June 2025): 575–620. <https://doi.org/10.1163/22119000-12340376>.
- 'Commercial Contracts 2025 - Iraq | Global Practice Guides | Chambers and Partners'. Accessed 1 February 2026. <https://practiceguides.chambers.com/practice-guides/commercial-contracts-2025/iraq/trends-and-developments/O23676>.
- '\_\_\_\_\_. Accessed 1 February 2026. <https://practiceguides.chambers.com/practice-guides/commercial-contracts-2025/iraq/trends-and-developments/O23676>.
- Ismawati, and Suud Sarim Karimullah. 'Consumer Protection in the Digital Era: An Analysis of Consumer Protection in E-Commerce'. *NUSANTARA: Journal Of Law Studies* 3, no. 02 (December 2024): 68–80. <https://doi.org/10.5281/zenodo.17376951>.
- Jaffar, Ako Abubakr, Mazen Ismaeel Ghareb, and Karzan Hussein Sharif. 'The Challenges of Implementing E-Commerce in Kurdistan of Iraq'. *Journal of University of Human Development* 2, no. 3 (August 2016): 528–533. <https://doi.org/10.21928/juhd.v2n3y2016.pp528-533>.
- Khraisat, Ansam, and Ammar Alazab. 'A Critical Review of Intrusion Detection Systems in the Internet of Things: Techniques, Deployment Strategy, Validation Strategy, Attacks, Public Datasets and Challenges'. *Cybersecurity* 4, no. 1 (March 2021): 18. <https://doi.org/10.1186/s42400-021-00077-7>.

- Miles, Matthew B, and A. Michael Huberman. *Analisis Data Kualitatif: Buku Sumber Tentang Metode-Metode Baru*. Jakarta: Universitas Indonesia Press, 2014.
- Munawaroh, Nuril Aulia, Sudarmiatin, Erry Tri Djatmika, Agus Hermawan, and Miftahul Munir. 'Digital Empowerment and E-Commerce Adoption among Handicraft SMEs: A Contemporary Islamic Economic Law Study Using the TOE Framework'. *MILRev: Metro Islamic Law Review* 4, no. 2 (December 2025): 1427–1448. <https://doi.org/10.32332/milrev.v4i2.11731>.
- Musmualim, Musmualim, Fokky Fuad, and Suartini Suartini. 'Legal Protection for Consumers in Transations E-Commerce by Era Digital'. *Eduvest - Journal of Universal Studies* 4, no. 12 (December 2024): 11935–11943. <https://doi.org/10.59188/eduvest.v4i12.33413>.
- Nather, Ibrahim T., and M. A. Burhanuddin. 'Determining the Impact Factors of E-Commerce Adoption by Smes in Iraq: An Overview'. SSRN Scholarly Paper No. 3930578. Rochester, NY: Social Science Research Network, 2018. <https://papers.ssrn.com/abstract=3930578>.
- 'OECD Recommendation of the Council on Consumer Protection in E-Commerce. OECD Legal Instruments, No. 336. Paris: Organisation for Economic Co-Operation and Development, 2016 (Rev. 2019)'. n.d. Accessed 1 February 2026. <https://legalinstruments.oecd.org/public/doc/336/336.en.pdf>.
- Prova, Nuzhat Noor Islam, Vishnu Ravi, Maninder Pal Singh, Vineet Kumar Srivastava, Srinivas Chippagiri, and Arun Pratap Singh. 'Multilingual Sentiment Analysis in E-Commerce Customer Reviews Using GPT and Deep Learning-Based Weighted-Ensemble Model'. *International Journal of Cognitive Computing in Engineering* 7, no. 1 (2026): 268–286. <https://doi.org/10.1016/j.ijcce.2025.10.003>.
- Shakir, Ahmed Hasan, Kadhim Ghaffar Kadhim, Amjed Hameed Majeed, Hasan Majdi, and Hayder Jawad Kadhim Murshedi. 'Towards Alleviating Poverty: Study The Impact of E-Commerce, Digital Marketing, and Digitalization's on Improving Economic Growth in Iraq'. *AgBioForum* 27, no. 1 (2025): 49–57.
- Shakir, Ahmed Hasan, Kadhim Ghaffar Kadhim, Amjed Hameed Majeed, Prof Dr Hasan Majdi, and Hayder Jawad Kadhim Murshedi. 'The Impact of E-Commerce, Digital Marketing, and Digitalization on Firm's Growth in Iraq'. *AGBIOFORUM* 26, no. 3 (2024): 74–82.
- \_\_\_\_\_. 'Towards Alleviating Poverty: Study The Impact of E-Commerce, Digital Marketing, and Digitalization's on Improving Economic Growth in Iraq'. *AGBIOFORUM* 27, no. 1 (June 2025): 49–57.

- Wang, Shiqiang, Haoning Liu, Zhuonan Li, and Shu Zhang. 'Security Risks and Regulation of Cross-Border e-Commerce in Digital Economy'. *Journal of Electronic Business & Digital Economics* 4, no. 2 (November 2025): 385–401. <https://doi.org/10.1108/JEBDE-12-2024-0053>.
- Wang, Wenju, Xuedong Liang, Xiangrui Chao, and Zhongbin Wang. 'E-Commerce for Social Media Platforms: Co-Opition and Traffic Distribution'. *Omega (United Kingdom)* 142 (2026). <https://doi.org/10.1016/j.omega.2026.103524>.
- Wibowo, Dwi Edi. 'Consumer Protection in the Digital Era: Challenges and Solutions from an Islamic Legal Perspective'. *Jurnal Ilmiah Mizani: Wacana Hukum, Ekonomi Dan Keagamaan* 11, no. 2 (October 2024): 473–485. <https://doi.org/10.29300/mzn.v11i2.4752>.
- Yassin, Mohammad Ali Abdulhasan, Zainab Pourkhaqan Shahrezaee, Ayad Abdul Hamzah Baawi, and Mohammad Sharif Shahi. 'Examination of the Status of Privacy in the Legal Systems of Iran and Iraq'. *Interdisciplinary Studies in Society, Law, and Politics* 3, no. 3 (July 2024): 75–88. <https://doi.org/10.61838/kman.isslp.3.3.10>.
- Zaboon, Amel Asmar, Nadia Khutheir Ganawi, and Alaa Abbas Dakhil. 'The Role of E-Commerce Industry in the Sustainable Economic Development of Iraq'. *International Journal of Entrepreneurship* 22, no. Specialissue (2018).