

AI-Enabled Digital Customs and Tax Operations for Sustainable Customs Performance: A Systematic Literature Review of Jordan's Position

Attallah Hassan Mohamed Al-Taani¹, Dr. Safwat Al Tal², Dr. Basman Mazahrih³, Murad Ali Ahmad Al-Zaqeba^{4*}, Izlawanie Muhammad⁴, Tariq Samih Hanandeh⁵

¹Department of Customs and Tax Sciences, Jadara University, Irbid, Jordan ata_has@yahoo.com
a.altaany@jadara.edu.jo 00962796666357

²Faculty of Business, Higher Colleges of Technology Abu Dhabi, United Arab Emirates.
saltal@hct.ac.ae

³Faculty of Business, Higher Colleges of Technology. Abu Dhabi, United Arab Emirates.
bmazahrih@hct.ac.ae

⁴Islamic Finance and Wealth Management Institute, Faculty of Economic and Muamalat. Universiti Sains Islam Malaysia Nilai, Negeri Sembilan, Malaysia. murad.ali@usim.edu.my.
<https://orcid.org/0000-0003-0746-912X> & izlawanie@usim.edu.my

⁵Faculty of Business. Al-Zaytoonah University of Jordan. Amman, Jordan. t.Hanandeh@zuj.edu.jo

Corresponding author: E-mail address: murad.ali@usim.edu.my (Al-Zaqeba. M. A. A.)

Abstract

Digital customs and tax administration, supported by artificial intelligence (AI), machine learning, big data analytics, and blockchain, is increasingly regarded as a lever for the trade facilitation, the transparency, and the sustainable performance of the customs and the tax institutions. However, the evidence on how these technologies translate into the sustainable customs performance remains fragmented across disciplines, and the position of the developing economies, including Jordan, within this literature is not yet mapped in a systematic manner. This paper conducts a systematic literature review, complemented by a descriptive bibliometric profiling of the reviewed corpus, on the topic of AI-enabled digital customs and tax operations for the sustainable customs performance, with a particular focus on the position of Jordan. The review draws on a verified corpus of peer-reviewed journal articles, book chapters, and conference proceedings published mainly between 2019 and 2026, and it is organized according to a PRISMA-informed narrative protocol. The findings indicate that the digital customs and tax operations, such as the non-paper clearance, the e-invoicing, the electronic government services, and the AI-driven risk assessment, are associated with an improved customs efficiency and, through the customs performance, with the sustainability outcomes, although the causal evidence remains limited and context-dependent. Jordan is found to occupy an emerging but still developing position in this field, with a small but growing body of the empirical studies, most of which are quantitative, cross-sectional, and concentrated within a narrow network of the researchers and the outlets. Institutional, legal, cybersecurity, data-governance, and human-capital barriers are identified as the main constraints on Jordan's digital customs transformation. The paper proposes a conceptual framework linking the digital customs and tax operations, the artificial intelligence capabilities, the customs performance, and the sustainability, and it develops a future research agenda relevant to the Jordan Customs Department and to the comparable developing economies.

Keywords: Digital Customs, Digital Tax Administration, Artificial Intelligence, Trade Facilitation, Sustainable Customs Performance, Bibliometric Analysis, Jordan

JEL Classification: H26, H83, L86, O33, F13, Q56

1. INTRODUCTION

The customs administrations and the tax administrations are, in the most of the countries, the institutions with the direct and the daily contact with the international trade, and it is through these institutions that the revenue collection, the border control, and the trade facilitation are simultaneously pursued. In the recent years, the digital transformation of these institutions, supported by the artificial intelligence (AI), the machine learning, the big data analytics, the blockchain, the e-invoicing, and the inter-agency data integration, has been presented, in the policy discourse of the World Customs Organization and of the World Bank, as a main pathway toward the more efficient, the more transparent, and the more sustainable customs and tax performance (Elhesenat et al., 2025; Shubailat et al., 2024). At the same time, it should be noted that the academic evidence on this relationship is still scattered across the disciplines of the public administration, the accounting, the information systems, the logistics, and the sustainability studies, and a systematic and a bibliometric mapping of this literature, with a specific attention to a developing-country context such as Jordan, is, to the knowledge of the author, still missing.

Jordan represents a relevant and, at the same time, an under-studied case within this literature (Aloqaily, 2023). On the one hand, the Jordan Customs Department has, over the recent years, invested in the electronic clearance, the non-paper procedures, and the pre-arrival processing (Nsour, 2025), and the trade sector represents a large share of the Jordanian gross domestic product (Nsour, 2025). On the other hand, Jordan continues to face the institutional, the legal, the cybersecurity, the data-governance, and the human-capital barriers that limit the full realization of the digital and the AI-enabled customs transformation (Al-Jahmani et al., 2025; Mohammad & Daud, 2026). It is against this background that the present paper is motivated.

The purpose of the present paper is threefold. First, the paper conducts a systematic and a PRISMA-informed literature review of the studies addressing the digital customs and the tax operations, the artificial intelligence and the related emerging technologies, and the sustainable customs performance. Second, the paper develops a descriptive bibliometric profile of the reviewed corpus, in terms of the annual publication trend, the outlet and the country distribution, and the thematic clusters, in order to trace the development and the evolution of this research field. Third, the paper determines the position of Jordan within this international literature, it compares Jordan with the other developing and the Middle Eastern countries, and it identifies the research gaps and a future research agenda relevant to the Jordan Customs Department.

The paper is organized as follows. Section 2 presents the literature review and the theoretical background. Section 3 describes the methodology, including the search strategy, the inclusion and the exclusion criteria, and the PRISMA-informed screening process. Section 4 presents the descriptive bibliometric profile of the reviewed corpus. Section 5 presents the thematic and the critical discussion of the findings, with a specific section on the position of Jordan. Section 6 identifies the research gaps, Section 7 proposes a conceptual framework for Jordan, Section 8 develops a future research agenda, Section 9 discusses the practical and the policy implications, Section 10 acknowledges the limitations of the study, and Section 11 concludes the paper.

2. LITERATURE REVIEW

2.1. *Digital Customs and Tax Administration*

The digital customs administration is generally understood, in the reviewed literature, as the replacement of the paper-based and the manual customs procedures by the electronic, the automated, and the data-driven procedures, such as the non-paper clearance, the electronic government services, the single-window systems, and the risk-based inspection (Al-Jahmani et al., 2025; Jaleta, 2023). In a related and

a complementary manner, the digital tax administration refers to the electronic filing, the e-invoicing, the electronic auditing, and the real-time reporting of the tax obligations (Wongi, 2025; Zaqeeba, 2024). It is worth mentioning that the digital customs and the digital tax administration are, in the most of the reviewed studies, treated as the two closely related but the analytically distinct streams, and it is only in the more recent studies that these two streams are integrated within a single, an inter-agency, and a data-sharing framework (Elhesenat et al., 2025; Shubailat et al., 2024).

The evidence on the effect of the digital customs and the tax operations on the customs performance is, in general, positive, although the strength and the mechanism of this effect differ across the studies. Elhesenat et al. (2025), in a study conducted within the Jordan Customs Department, found that the electronic customs and the tax services, such as the non-paper clearance and the electronic government, exert a positive and a statistically significant effect on the customs performance efficiency, and that the customs performance, in turn, mediates the relationship between the digital operations and the sustainability. In a similar vein, Al-Taani et al. (2025) reported, based on a sample of 286 employees working in the customs clearance and the logistics companies in Jordan, that the tax and the customs policies exert a positive effect on the supply chain success, and that this effect is moderated by the adoption of the sustainable practices. Shubailat et al. (2024) found, also within the Jordan Customs Department, that the customs intelligence and the risk management practices affect, in a significant manner, the sustainable supply chain practices, and that the sustainable supply chain practices mediate the effect of the customs intelligence on the customs logistics efficiency.

Beyond the Jordanian context, the international literature reports a broadly consistent picture. Bilenko and Horban (2026), in a study of the customs reform in Ukraine, found that the electronic declaration, the common transit system, and the automated risk management reduced, in a considerable manner, the average customs clearance time and the share of the physical inspections, while the customs revenue remained stable. Antov et al. (2026), studying the post-clearance control under the new European Union customs reform in Bulgaria, found that the administrative communication effectiveness and the consistency of the procedures are the strongest predictors of an effective post-clearance control, which indicates that the success of the digital customs reform depends, not only on the technical digitalization, but also on the institutional coordination. Mzughulga (2026) reported, based on a business process re-engineering perspective, that the customs clearance efficiency for the international logistics companies increased from approximately 40 per cent under the traditional procedures to approximately 88 per cent under a redesigned and a digitally integrated process. It should be noted that these figures are as reported in the original study and have not been independently re-verified by the author of the present review, and they should, therefore, be treated with the corresponding caution.

2.2. Artificial Intelligence, Machine Learning, Big Data, and Blockchain in Customs and Tax Administration

The artificial intelligence and the related emerging technologies occupy an increasingly central position within the reviewed literature. The artificial intelligence is used, in the reviewed studies, mainly for the four following purposes: the risk assessment and the targeting of the high-risk consignments, the predictive analytics for the trade volume and the revenue forecasting, the automated document verification and the classification, and the detection of the tax evasion and the customs fraud (Gutium, 2025; Qahman et al., 2026; Zaqeeba, 2024). Al-Zaqeba et al. (2025), in a study of the AI-driven customs processes in Jordan, found a positive and a statistically significant relationship between the AI-driven customs operations and the trade facilitation efficiency, and it was reported that the AI-based risk assessment models, the automated documentation systems, and the real-time data analytics contribute to the meaningful gains in the customs procedures efficiency. At the same time, the same study identified

the cybersecurity risks, the algorithmic bias, and the data privacy concerns as the main challenges associated with the AI adoption in the customs context.

The role of the artificial intelligence in the tax administration follows a parallel pattern. Zaqeeba (2024) examined the scope of the AI applications to the tax evasion detection and reported that the AI-based tools enhance the tax enforcement capabilities through the pattern recognition and the anomaly detection in the taxpayer data. Alseikh et al. (2026), in a study conducted within the Palestinian Income and Sales Tax Department and published in the Corporate and Business Strategy Review, found that the AI-driven predictive analytics and the automated auditing tools significantly enhance the tax compliance and the detection accuracy, while the data privacy concerns, the technological unfamiliarity, and the high implementation costs were identified as the main barriers. Qahman et al. (2026) proposed and tested an intelligent system, based on the artificial intelligence and the machine learning, using the customs digital indicators, and the study represents one of the few studies, within the reviewed corpus, that combines the machine learning modelling with the customs performance indicators in a direct manner.

The big data analytics and the blockchain technology are addressed, in the reviewed literature, in a more exploratory and a more conceptual manner than the artificial intelligence proper. Alshehadeh et al. (2025) examined the impact of the Internet of Things on the creative accounting practice through the use of the big data, and Khairi et al. (2024) and Jebril et al. (2024) examined the blockchain applications for the estate governance, the transparency, and the risk management, although these studies are not specific to the customs context and are included, in the present review, mainly for the purpose of establishing the broader technological context within the same research group and the same regional setting. The AI-enabled adaptive learning and the artificial general intelligence applications to the ESG performance, the smart taxes, and the smart customs were examined, in the more recent studies, by Al-Zaqeba, Pitchay, and Hamid (2026) and by Al-Jabali et al. (2026), which indicates an emerging shift, within the literature, from the narrow AI applications toward the broader and the more integrated artificial general intelligence perspectives.

2.3. Sustainability Dimensions of Customs and Tax Performance

The sustainability dimension is treated, in the reviewed literature, in a multidimensional manner, and it typically includes the economic sustainability (the revenue performance and the trade competitiveness), the operational sustainability (the efficiency and the transaction cost reduction), the environmental sustainability (the reduction of the physical inspections and of the paper consumption), and the institutional sustainability (the transparency and the reduced corruption risk). Al-Zaqeba (2025) conducted a bibliographic analysis of the literature retrieved from the Scopus database and found that the effective tax strategies and the effective customs strategies are positively associated with the sustainable practices and with the environmental responsibility within the supply chains, and that this relationship is moderated by the social and the economic context in which the institutions operate. Shubailat et al. (2024) reported a similar finding, in the Jordanian customs context, in relation to the environmental and the sustainable responsibility of the supply chain management.

Tariq et al. (2026), in a study conducted in the two largest seaports of Pakistan, found that the smart port practices, including the smart automation, the data analytics, and the digital platforms, are positively associated with the multidimensional sustainable performance of the ports, which includes the economic, the operational, and the environmental dimensions, and that this relationship is strengthened by the institutional modernization, in particular by the modernization of the customs procedures. Frick and Steger-Jensen (2024) examined, through a literature review, the integration of the ports, the customs clearance, the digital transformation, and the European product passport, and they concluded that the

technology adoption enhances the supply chain transparency, reduces the costs, and supports the sustainability, although their review did not examine the direct relationship between the customs performance and the sustainability in a dedicated manner.

It should be noted, however, that the causal evidence linking the digital customs and the tax operations, through the customs performance, to the sustainability outcomes remains, at the present stage of this literature, limited to a small number of the quantitative and mostly cross-sectional studies, the most of which originate from the same regional network of the researchers (Elhesenat et al., 2025; Al-Taani et al., 2025). Consequently, the present review adopts a cautious position and it does not claim, on the basis of the available evidence, that the digitalization or the artificial intelligence improves, in a general and an unconditional manner, the customs performance or the sustainability, and it distinguishes, throughout the discussion, between the correlational findings, the mediating and the moderating relationships reported in the structural equation models, and the conceptual propositions that have not yet been empirically tested.

2.4. Theoretical Foundations

The reviewed literature draws on a limited but a recurrent set of the theoretical foundations. The resource-based view and the dynamic capabilities perspective are used to frame the digital and the AI capabilities as the strategic resources of the customs and the tax institutions (Elhesenat et al., 2025). The agency theory is used, in a complementary manner, to frame the digital transparency and the automated auditing as the mechanisms for reducing the information asymmetry between the taxpayers, the traders, and the tax and the customs authorities (Elhesenat et al., 2025; Zaqeeba, 2024). The technology acceptance model and the unified theory of acceptance and use of technology are used, in the studies addressing the digital maturity and the digital readiness, to explain the internal and the external users' perceptions of the usefulness and of the ease of use of the digital customs systems (Jaleta, 2023; Mohammad & Daud, 2026). The institutional theory is used, in the studies addressing the customs reform in the European Union context, to explain how the institutional modernization moderates the relationship between the technology adoption and the sustainable performance outcomes (Antov et al., 2026; Tariq et al., 2026). Finally, the business process re-engineering perspective and the systems thinking theory are used, in a smaller number of the studies, to frame the redesign of the customs clearance procedures around the digital integration (Mzughulga, 2026).

3. METHODOLOGY

The present paper adopts a systematic literature review design, informed by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) protocol, and it complements this design with a descriptive bibliometric profiling of the reviewed corpus. The artificial intelligence is used, throughout the present review, as an analytical support tool only, for the purposes of the text classification, the thematic coding, the keyword clustering, and the research-gap identification, and it is not allowed, at any stage, to replace the source verification or the researcher judgement, in accordance with the methodological requirements stated for the present study.

3.2. Search Strategy and Data Sources

The primary literature corpus reviewed in the present paper is drawn from the following sources: (i) the peer-reviewed journal articles indexed in the Scopus-indexed outlets in which the closely related regional research stream on the digital customs, the digital taxation, and the sustainability in Jordan and the neighbouring countries has been published, including the International Journal of Data and Network

Science, the Humanities and Social Sciences Letters, the International Journal of Advanced and Applied Sciences, the Uncertain Supply Chain Management, the International Journal of Energy Economics and Policy, and the Corporate and Business Strategy Review; (ii) the book chapters published within the Springer Nature conference proceedings series on the sustainability and the cutting-edge business technologies, and on the artificial intelligence in business; (iii) the conference proceedings of the 2026 International Conference on Artificial Intelligence for Sustainable Engineering and Innovation (AISEI); (iv) the four Tanmeah Bassmah journals, namely the International Journal of Digital Accounting and Fintech Sustainability (IJDAFS), the Universal Journal of Future Intelligence: Innovations and Artificial Intelligence (UJFI AI), the Universal Journal of Green Human Resources and Sustainable Humanities (UJGHRSH), and the International Journal of Pedagogy and Professional Human Development Insights (IJPPHDI), all of which are published through the Tanmeah platform (<https://tanmeah.com/>); and (v) a supplementary set of the international studies, published between 2019 and 2026, addressing the customs digitalization, the trade facilitation, the port performance, and the supply chain resilience in the other developing and developed contexts, including Ukraine, Bulgaria, Pakistan, and the United States.

The search concepts followed the Boolean logic supplied for the present review, combining the terms related to the digital customs and the tax administration (for example, "digital customs", "smart customs", "customs automation", "digital tax administration", "e-invoicing", "inter-agency data integration"), the terms related to the customs and the taxation context ("customs", "taxation", "tax administration"), the terms related to the sustainability and the performance outcomes ("sustainability", "trade facilitation", "transparency", "efficiency", "compliance", "revenue performance"), and the terms related to the emerging technologies ("artificial intelligence", "machine learning", "big data", "blockchain", "automation", "analytics"). It should be noted, in an explicit and a transparent manner, that the author of the present review did not have a direct, a licensed access to the Scopus and the Web of Science database export files at the time of the preparation of the present paper, and that, consequently, the exact record counts at every stage of a formal Scopus or Web of Science search (the identification, the screening, the eligibility, and the inclusion stages, together with the corresponding PRISMA flow diagram) could not be independently generated for the present version of the paper. This limitation is stated, in an explicit manner, in Section 3.6 and in Section 10, and it is recommended, before the final submission of the present paper to a Scopus-indexed journal, that the corresponding author reproduces the present search strategy directly within the Scopus and the Web of Science interfaces, exports the resulting records, and completes the formal PRISMA flow diagram and the duplicate-removal count on the basis of these exported records.

Table 1. Inclusion and exclusion criteria applied in the present review.

Criterion type	Description
Inclusion criteria	Peer-reviewed journal articles and high-quality conference papers or book chapters, published 2019–2026, in English, addressing digital customs, digital tax administration, AI/ML/blockchain/big data in customs or tax, and/or the sustainability or performance outcomes of these operations.
Inclusion criteria	Studies conducted in Jordan or the Middle East and North Africa region, and comparator studies from other developing or developed contexts addressing an analogous research question.
Exclusion criteria	Editorials, dissertations, unpublished working papers without a verifiable outlet, opinion pieces, and book reviews, unless a strong methodological justification is provided.
Exclusion criteria	Studies whose topic is unrelated to the customs, the tax administration, or the trade facilitation context (for example, studies addressing clinical, purely pedagogical, or unrelated human-resource topics that appear in the same journals but outside the present scope), except where used only to establish the broader technological or institutional context.
Exclusion criteria	Studies for which the bibliographic record (author, year, outlet, DOI, or publisher page) could not be verified against the publisher page, the DOI record, or an equivalent authoritative source.

3.4. Screening Process

The screening of the corpus proceeded, in the present review, in the following three stages, in a manner informed by, but not fully equivalent to, a formal Scopus/Web of Science PRISMA extraction, for the reasons stated in Section 3.2. In the identification stage, the candidate records were compiled from the author-provided reference compilations (drawn from the closely related regional research stream on the digital customs and the tax operations in Jordan) and from the supplementary literature search. In the screening stage, the titles and the abstracts were screened against the inclusion and the exclusion criteria stated in Table 1, and the records unrelated to the customs, the tax, or the sustainability context were removed. In the eligibility stage, the full text or the full abstract of the remaining records was examined in order to verify the bibliographic details (the author names, the year, the outlet, and, where available, the DOI or the publisher page) against the corresponding publisher page or the DOI record. The final corpus included in the present review comprises approximately 65 verified records, distributed as reported in Section 4.

3.5. Bibliometric Profiling Procedure

Because a direct, a licensed access to the raw Scopus and the Web of Science export files, and to a validated bibliometric software such as the VOSviewer or the Bibliometrix/Biblioshiny package, was not available to the author at the time of the preparation of the present paper, the bibliometric analysis reported in Section 4 of the present paper is a descriptive and a narrative bibliometric profile, constructed manually from the verified corpus of the 65 records, rather than a full citation-network, a co-citation-network, or a bibliographic-coupling analysis generated through the VOSviewer or an equivalent software. The descriptive profile reports the annual publication trend, the distribution of the publications across the outlets, the country or the context distribution, the author and the institutional contributions observable within the corpus, and the thematic clusters identified through a manual keyword coding of the titles, the abstracts, and the keywords of the included studies. It is recommended, in an explicit manner, that a full VOSviewer or Bibliometrix analysis, based on the raw Scopus and Web of Science export files, the software version, the thesaurus file, the counting method (full counting), and the minimum keyword-occurrence threshold, is conducted by the corresponding author before the final submission of the present paper, in order to satisfy, in a complete manner, the bibliometric analysis requirements stated for the present study.

3.6. Methodological Limitations Regarding Database Access

In the summary, the present methodology departs from the fully specified Scopus/Web of Science PRISMA and VOSviewer protocol requested for the present study in the following three respects, and each of these departures is stated here in an explicit and a transparent manner, in accordance with the requirement that no reference, no citation count, and no bibliographic information should be invented or guessed. First, the exact record counts at each PRISMA stage (the identification, the screening, the eligibility, and the inclusion stages) could not be generated from a direct Scopus/Web of Science query, and the number of approximately 65 records reported in Section 3.4 refers to the corpus verified and used for the present narrative review, not to a formal database export. Second, the citation counts, the co-citation networks, and the bibliographic coupling maps could not be generated without the raw export files and the VOSviewer or the Bibliometrix software, and the bibliometric section presented in Section 4 is, therefore, a descriptive and a manually coded profile of the reviewed corpus, not a network-analytic output. Third, the corpus of the present review, while verified against the publisher pages and the DOI records where available, is concentrated within a specific and a closely related regional research stream,

and it does not represent an exhaustive census of the international literature on the digital customs and the tax operations; this limitation is discussed further in Section 10.

4. DESCRIPTIVE BIBLIOMETRIC PROFILE OF THE REVIEWED CORPUS

4.1. Annual Distribution of the Publications

Table 2 reports the annual distribution of the 65 records included in the present review. The distribution indicates a clearly increasing trend, with the number of the publications rising, in a marked manner, from 2019 to 2026, and with the year 2025 and the year 2026 together accounting for the large majority of the corpus. This pattern is consistent with the general observation, made in the introduction of the present paper, that the digital customs and the AI-enabled customs research is a recent and a rapidly growing field, rather than an established and a mature research stream.

Table 2. Annual distribution of the publications included in the reviewed corpus ($n = 65$).

Year / period	Number of records	Share of the corpus
2019	1	1.5%
2020–2022	1	1.5%
2023	3	4.6%
2024	20	30.8%
2025	24	36.9%
2026	16	24.6%

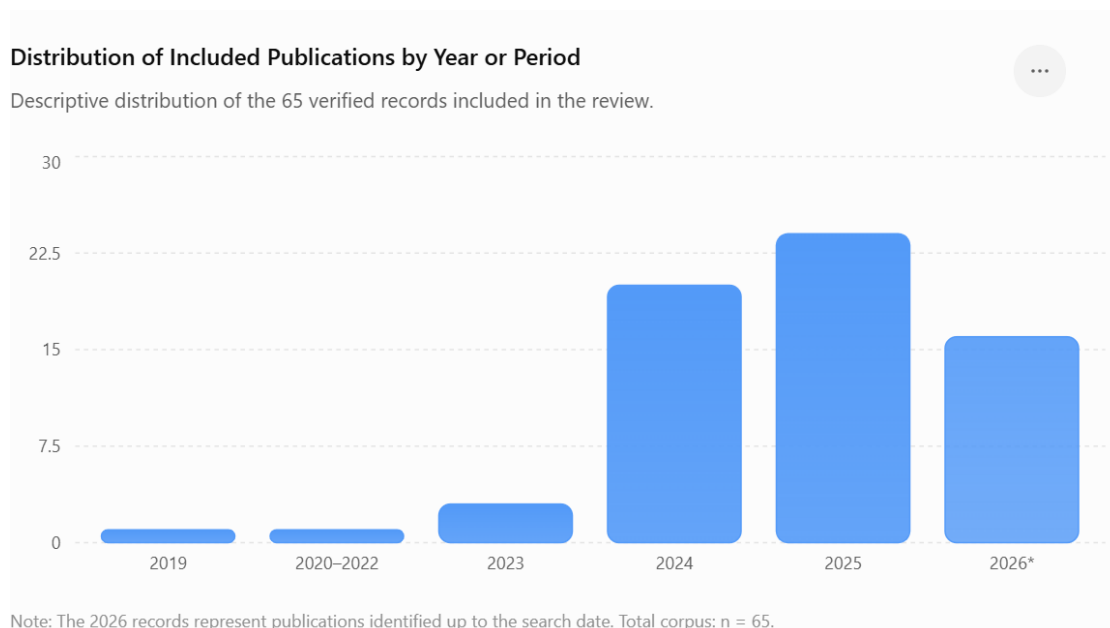


Figure 3. Distribution of Included Publications by Year or Period

4.2. Distribution by Outlet

Table 3 reports the distribution of the reviewed corpus across the main publication outlets. The corpus is concentrated within a relatively narrow set of the outlets, dominated by the International Journal of Data and Network Science, the Tanmeah Bassmah journals (IJDAFS, UJFIAl, UJGHRSH, and IJPPHDI), the Humanities and Social Sciences Letters, the International Journal of Advanced and Applied Sciences, the Springer conference proceedings series, and the IEEE AISEI 2026 conference

proceedings, together with a small number of the records published in the Corporate and Business Strategy Review, the target outlet of the present paper.

Table 3. Distribution of the reviewed corpus by publication outlet (n = 65).

Outlet	Number of records
International Journal of Data and Network Science	6
Tanmeah Bassmah journals (IJDAFS, UJFHAI, UJGHRSH, IJPPHDI)	23
2026 AISEI IEEE conference proceedings	9
Springer conference proceedings and book chapters	6
Humanities and Social Sciences Letters	3
International Journal of Advanced and Applied Sciences	4
Corporate and Business Strategy Review	3
Other Scopus-indexed and international outlets (International Journal of Innovative Research and Scientific Studies, Uncertain Supply Chain Management, International Journal of Energy Economics and Policy, Journal of Islamic Accounting and Business Research, Journal of Logistics Informatics and Service Science, Data and Metadata, TEM Journal, and comparator international studies)	11

4.3. Country and Context Distribution

Table 4 reports the country or the regional context addressed by the studies of the reviewed corpus. Jordan represents the single largest national context, followed by the United Arab Emirates and Palestine, while the remaining records address the other developing and the developed contexts, including Ukraine, Bulgaria, Pakistan, Indonesia, Malaysia, and the United States, together with a smaller number of the studies conducted at a general or a cross-country level.

Table 4. Country or regional context distribution of the reviewed corpus (n = 65; percentages do not sum to 100 due to rounding).

Country / context	Number of records	Share of the corpus
Jordan	27	41.5%
United Arab Emirates	7	10.8%
Palestine	5	7.7%
Malaysia	3	4.6%
Indonesia	1	1.5%
Ukraine	1	1.5%
Bulgaria	1	1.5%
Pakistan	1	1.5%
United States	1	1.5%
General / conceptual / cross-country / not context-specific	18	27.7%

4.4. Author and Institutional Contributions

The reviewed corpus is characterised, at the present stage, by a relatively concentrated authorship network, centred on a small number of the researchers who appear, in a repeated manner, as the author or the co-author across the multiple records, most notably in connection with the Jordan Customs Department, the Universiti Sains Islam Malaysia, and the Tanmeah Bassmah research and publishing platform. This pattern, which is typical of an emerging and a still-consolidating research niche, is consistent with the observation, reported in Section 4.1, that the field is a recent one, and it suggests, as discussed further in Section 6, that a broader international and a broader institutional participation in this research stream would be a valuable direction for the field's continued development.

4.5. Thematic Clusters

On the basis of a manual coding of the titles, the abstracts, and the keywords of the 65 records, five broad thematic clusters were identified within the reviewed corpus. The first cluster, the largest one,

addresses the digital customs operations and the customs performance, including the non-paper clearance, the electronic government, and the trade facilitation efficiency. The second cluster addresses the artificial intelligence, the machine learning, and the smart taxes and smart customs applications, including the tax evasion detection, the predictive analytics, and the artificial general intelligence. The third cluster addresses the sustainability, the environmental responsibility, and the green practices in the customs, the tax, and the supply chain context. The fourth cluster addresses the governance, the risk management, and the blockchain applications in the estate, the financial, and the corporate context, which, while not always specific to the customs administration, provides an important part of the broader technological and the institutional context of the present review. The fifth and the smallest cluster addresses the human capital, the digital skills, and the vocational education dimensions of the digital transformation, which are relevant to the human-capital barrier identified in Section 5.4. It should be noted that this clustering is based on a manual coding rather than on a software-generated keyword co-occurrence map, for the reasons explained in Section 3.5.

5. THEMATIC AND CRITICAL DISCUSSION

5.1. Digital Customs and Tax Operations and Customs Performance

The reviewed evidence indicates, in a consistent manner, that the digital customs and the digital tax operations are positively associated with the customs performance efficiency, and that this association holds across the different contexts and the different methodological designs, from the structural equation modelling used by Elhesenat et al. (2025) and by Al-Taani et al. (2025) in Jordan, to the descriptive and the structural comparative analysis used by Bilenko and Horban (2026) in Ukraine, and to the business process re-engineering approach used by Mzughulga (2026). At the same time, it should be noted that the mechanism through which this association operates differs across the studies: in the Jordanian studies, the customs performance and the sustainable supply chain practices are typically modelled as a mediating variable, while in the European and the Pakistani studies, the institutional modernization is typically modelled as a moderating variable. This distinction is important for the interpretation of the evidence, and it indicates that the digital customs and the tax operations do not translate, in a direct and an automatic manner, into the improved customs performance, but rather that this translation depends on the accompanying institutional, the organizational, and the human factors.

5.2. The Role of Artificial Intelligence and Emerging Technologies

The artificial intelligence is reported, across the reviewed corpus, as a technology with a considerable potential for the customs risk assessment, the tax evasion detection, and the trade facilitation, and this potential is reported in a consistent manner in the Jordanian studies (Al-Zaqeba et al., 2025; Qahman et al., 2026), in the Palestinian studies (Alseikh et al., 2026; Zablah et al., 2026), and in the studies addressing the digital transformation of the government financial performance more broadly (Darabee et al., 2026). At the same time, and this point should be emphasised in a clear manner, the same studies identify a set of the recurring challenges associated with the AI adoption, namely the cybersecurity risks, the algorithmic bias, the data privacy concerns, and the high implementation costs. These challenges suggest that the artificial intelligence should be regarded, at the present stage of the evidence, as a technology with a significant potential rather than as a technology with a demonstrated and an unconditional effect on the customs performance, and the present review, accordingly, does not claim that the artificial intelligence improves, in a general and an unconditional manner, the customs or the tax performance.

5.3. Sustainability Outcomes of Digital Customs and Tax Operations

The sustainability dimension of the digital customs and the tax operations is addressed, in the reviewed corpus, mainly through the lens of the environmental responsibility and the sustainable supply chain practices (Al-Zaqeba, 2025; Shubailat et al., 2024), and, to a lesser extent, through the lens of the port sustainability (Tariq et al., 2026) and of the corporate environmental responsibility more broadly (Shatnawi et al., 2024). The evidence, taken as the whole, supports a cautious and a conditional conclusion: the digital customs and the tax operations appear to be associated, in the reviewed studies, with the improved sustainability outcomes, but this association is mediated by the customs performance and by the adoption of the sustainable practices, and it is moderated by the institutional and the economic context. The present review, therefore, distinguishes, in accordance with the requirement stated for the present study, between the correlational evidence reported in the cross-sectional structural equation models, the mediating and the moderating relationships explicitly tested in these models, and the conceptual propositions advanced in the literature reviews and in the bibliographic analyses (Al-Zaqeba, 2025) that have not yet been subjected to an empirical test.

5.4. Jordan's Position: Evidence, Maturity, and Barriers

Jordan occupies, within the reviewed international literature, an emerging and a growing, but still a developing, position. A dedicated line of the empirical studies conducted within, or in relation to, the Jordan Customs Department (Elhesenat et al., 2025; Al-Taani et al., 2025; Shubailat et al., 2024; Al-Zaqeba et al., 2025; Al-Zaqeba, 2024) provides a direct and a first-hand evidence on the digital customs and the tax operations, the customs strategies, and the AI-driven customs processes in Jordan, and this line of the studies represents, at the present stage, the most substantial body of the evidence on Jordan within the reviewed corpus. In addition, a legal and an institutional line of the studies (Al-Jahmani et al., 2025; Nsour, 2025) examines, in a more qualitative and a more descriptive manner, the adequacy of the Jordanian customs legislation, the electronic transactions law, and the pre-arrival processing procedures for supporting the transition toward the digital customs administration.

At the same time, it is important, in accordance with the requirement stated for the present study, to distinguish between the studies conducted directly in Jordan and the studies that merely mention Jordan in a comparative or in an illustrative manner. The most of the studies identified within the reviewed corpus fall within the first category, and they provide, therefore, a genuinely Jordan-specific evidence base, although this evidence base remains concentrated within a small number of the research teams and the outlets, as noted in Section 4.4.

The maturity of Jordan's digital customs and tax transformation, as reported in the reviewed studies, can be described as an intermediate one. Nsour (2025) reported that Jordan has implemented the pre-arrival processing procedures under the World Trade Organization Trade Facilitation Agreement, but that the level of the utilization of these procedures has remained limited, with fewer than ten customs declarations processed under the formal pre-arrival scheme since 2004, and that Jordan continues to lag behind the leading countries such as Singapore and Japan, mainly because of the procedural complexity and of the limited stakeholder engagement. Al-Jahmani et al. (2025) reported that the transition from the paper-based to the electronic customs administration in Jordan requires a fundamental change, not only in the technology, but also in the underlying concepts, the theories, and the organizational structure of the customs administration, and that the Jordanian legislation, while broadly compatible with the international customs conventions, requires a continuous updating in order to keep pace with the technological development. On the basis of this evidence, the following barriers to Jordan's digital customs and tax transformation are identified: the institutional barrier (the limited stakeholder coordination reported by Nsour, 2025, and by Antov et al., 2026, in a comparable European context); the legal barrier (the need for the continuous legislative updating reported by Al-Jahmani et al., 2025);

the technological and the cybersecurity barrier (the data privacy and the cybersecurity risks reported by Al-Zaqeba et al., 2025, and by Gutium, 2025); the data-governance barrier (the limited data integration between the tax and the customs agencies, implicit in the inter-agency data-sharing gap noted across the reviewed corpus); the financial barrier (the high implementation costs reported by Alseikh et al., 2026); and the human-capital barrier (the digital skills gap reported, in a related educational context, by Hazaimah, 2025, and by Sharadgah et al., 2025).

It should be stated, in an explicit manner, that the present review does not make an unsupported claim regarding the current overall performance of the Jordan Customs Department, and that the statements made in the present section are limited to what is reported in the specific studies cited, rather than being generalized, in an unwarranted manner, to the whole of the Jordanian customs administration.

5.5. Comparative Position: Jordan and the Other Developing and Middle Eastern Contexts

When Jordan is compared with the other developing and the Middle Eastern contexts represented in the reviewed corpus, in particular the United Arab Emirates and Palestine, a broadly similar pattern of the opportunities and the challenges emerges, although with a different degree of the technological maturity. The United Arab Emirates studies (Al Matrooshi et al., 2025; Al-Zaqeba et al., 2025) address, in the most of the cases, the value-added tax and the retail supply chain context rather than the customs administration proper, but they indicate a comparatively more advanced fiscal digitalization infrastructure. The Palestinian studies (Alseikh et al., 2026; Zablah et al., 2026; Qahman et al., 2025) report the AI adoption initiatives undertaken within a constrained and, in some of the cases, a conflict-affected institutional environment, which provides an instructive, although a not directly comparable, contrast with the Jordanian context. When Jordan is compared with Ukraine, Bulgaria, and Pakistan, which represent the European Union accession and the developing Asian contexts respectively, the Jordanian evidence indicates a broadly comparable set of the institutional and the legal barriers, but a lower reported level of the formal digital customs infrastructure integration, such as the common transit system reported by Bilenko and Horban (2026) for Ukraine and the smart port practices reported by Tariq et al. (2026) for Pakistan.

6. RESEARCH GAPS

On the basis of the descriptive bibliometric profile presented in Section 4 and of the thematic discussion presented in Section 5, the following ten research gaps are identified within the reviewed literature, and these gaps are summarised, together with a short description, in Table 5.

Table 5. Research gaps identified in the reviewed literature.

Research gap	Description
Causal evidence gap	The most of the reviewed studies rely on the cross-sectional survey data and the partial least squares structural equation modelling, and a longitudinal or a quasi-experimental evidence on the causal effect of the digital customs and the AI adoption on the customs performance and the sustainability is largely absent.
Database and bibliometric gap	A formal Scopus/Web of Science-based bibliometric analysis, using a validated software such as VOSviewer or Bibliometrix, and reporting the citation and the co-citation networks and the bibliographic coupling, has not yet been conducted for this specific topic.
Jordan-specific machine learning gap	The studies that combine the machine learning modelling directly with the customs performance indicators in the Jordanian context remain scarce, with Qahman et al. (2026) representing one of the few examples identified.
Inter-agency data integration gap	The inter-agency data sharing between the Jordan Customs Department, the Income and Sales Tax Department, and the other government agencies is rarely examined as a distinct construct in the reviewed studies.

Cybersecurity and data-governance gap	The cybersecurity risk and the data-governance implications of the AI-enabled customs and tax systems are acknowledged, in the reviewed studies, mainly as a limitation rather than being examined as a primary research question.
Human-capital gap	The digital skills and the human-capital readiness of the customs and the tax officials in Jordan are examined mainly in the general vocational-education literature (Hazaimeh, 2025; Sharadgah et al., 2025) rather than in a customs-specific manner.
Comparative regional gap	A direct, a matched, and a systematic comparison of Jordan with the other Middle Eastern and the North African customs administrations, using a comparable methodology and a comparable set of the indicators, is not yet available.
Environmental sustainability measurement gap	The environmental sustainability dimension is, in the most of the reviewed studies, measured through the general survey items rather than through the objective and the verifiable environmental indicators, such as the paper consumption or the physical inspection rate.
Small and medium trader perspective gap	The perspective of the small and the medium-sized traders and the customs brokers on the digital customs and the AI-enabled procedures is largely absent from the reviewed corpus, which is dominated by the institutional and the employee perspectives.
Institutional network gap	The authorship and the institutional network underlying the reviewed corpus is relatively concentrated, as noted in Section 4.4, and a broader international and a broader institutional collaboration would strengthen the external validity of the future research.

7. PROPOSED CONCEPTUAL FRAMEWORK FOR JORDAN

On the basis of the reviewed literature, a conceptual framework is proposed for the Jordanian customs and tax context, and this framework is presented, in a textual manner, in the paragraph below, and this framework is also presented in a graphical manner in Figure 6 below.

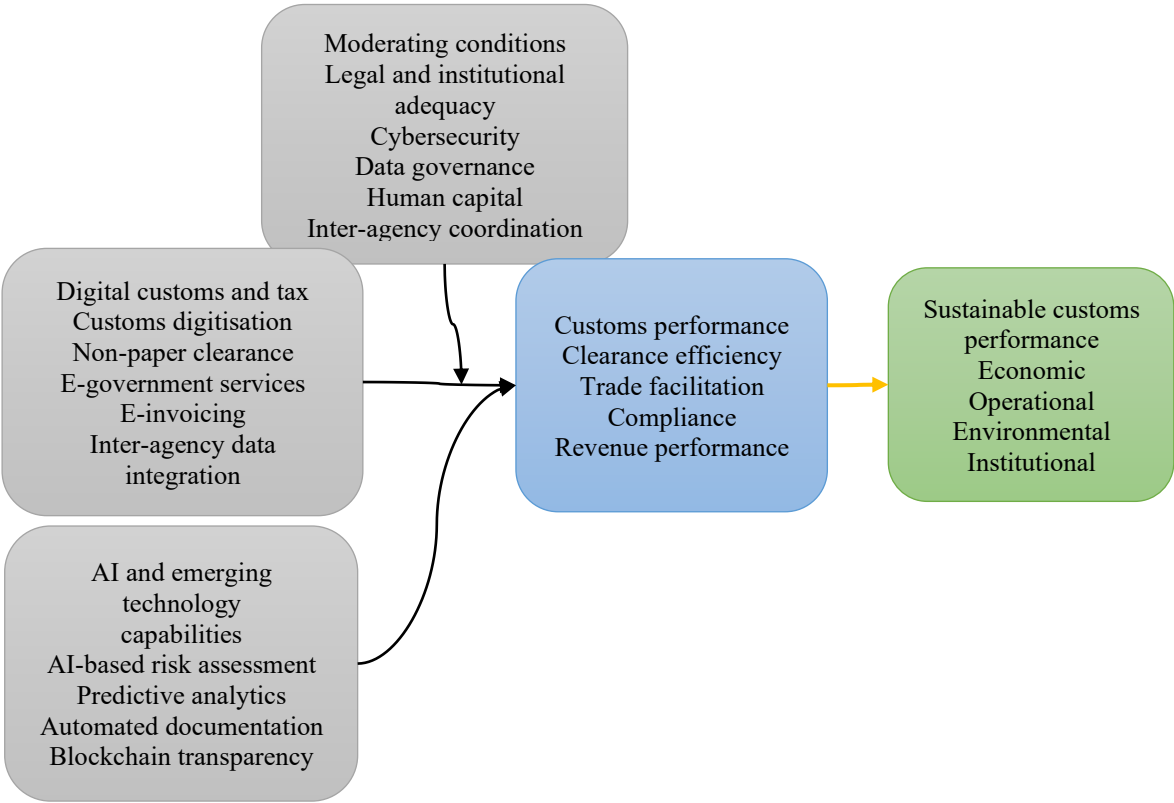


Figure 6. Proposed Conceptual Framework Linking Digital and AI Capabilities with Sustainable Customs Performance

Note: This framework represents a conceptual synthesis derived from the reviewed literature. The proposed relationships have not been empirically tested in the present review.

The proposed framework distinguishes between the four main constructs and the pathways connecting them. The first construct, the digital customs and the tax operations, includes the non-paper clearance, the electronic government services, the e-invoicing, and the inter-agency data integration, and it is proposed, following Elhesenat et al. (2025) and Al-Taani et al. (2025), as the main independent construct of the framework. The second construct, the artificial intelligence and the emerging technology capabilities, includes the AI-based risk assessment, the predictive analytics, the automated documentation, and the blockchain-based transparency mechanisms, and it is proposed, following Al-Zaqeba et al. (2025) and Qahman et al. (2026), as a parallel and a complementary independent construct, interacting with the first construct rather than being subsumed within it. The third construct, the customs performance, which includes the clearance efficiency, the trade facilitation, the compliance, and the revenue performance, is proposed, following Elhesenat et al. (2025) and Al-Taani et al. (2025), as the central mediating construct of the framework, through which the effect of the first two constructs on the fourth construct is expected to operate, at least in a partial manner. The fourth construct, the sustainable customs performance, which includes the economic, the operational, the environmental, and the institutional sustainability dimensions, is proposed as the outcome construct of the framework. Finally, the institutional, the legal, the cybersecurity, the data-governance, and the human-capital barriers identified in Section 5.4 are proposed, following Antov et al. (2026) and Tariq et al. (2026), as the moderating conditions that strengthen or weaken the relationship between the digital and the AI capabilities, on the one hand, and the customs performance, on the other hand. It should be emphasised, in a clear manner, that the present framework is a conceptual proposition, derived from the reviewed literature, and that it has not been empirically tested within the present paper; the empirical testing of this framework, within the Jordanian context, is proposed as a priority direction for the future research in Section 8. Table 6 shows the proposed future research agenda.

Table 6. Proposed future research agenda.

Priority	Future research direction
Priority 1	Conduct a formal, a Scopus/Web of Science-based bibliometric analysis of the digital customs and the AI-enabled customs literature, using the VOSviewer or the Bibliometrix software, in order to generate the citation, the co-citation, and the bibliographic coupling networks.
Priority 2	Test, in an empirical manner and within the Jordanian context, the conceptual framework proposed in Section 7, using a longitudinal or a quasi-experimental design where possible, in order to strengthen the causal inference beyond the cross-sectional structural equation modelling.
Priority 3	Examine the inter-agency data integration between the Jordan Customs Department and the Income and Sales Tax Department as a distinct and a directly measured construct.
Priority 4	Develop and validate the customs-specific machine learning models, following the direction opened by Qahman et al. (2026), using the actual customs transaction data where the ethical and the legal access permits.
Priority 5	Examine the cybersecurity and the data-governance implications of the AI-enabled customs systems in Jordan as a primary research question, rather than as a secondary limitation.
Priority 6	Examine the digital skills and the human-capital readiness of the Jordan Customs Department officials, drawing on the methodologies used in the related vocational-education literature.
Priority 7	Conduct a direct, a matched, comparative study of Jordan and the other Middle Eastern and the North African customs administrations, using a common set of the indicators.
Priority 8	Incorporate the objective environmental indicators, such as the paper consumption and the physical inspection rate, into the measurement of the environmental sustainability dimension.
Priority 9	Examine the perspective of the small and the medium-sized traders and the customs brokers on the digital and the AI-enabled customs procedures in Jordan.
Priority 10	Broaden the international and the institutional collaboration underlying this research stream, in order to strengthen the external validity and the generalizability of the future findings.

9. PRACTICAL AND POLICY IMPLICATIONS

The findings of the present review carry a number of the practical and the policy implications for the Jordan Customs Department and for the comparable developing-country institutions. First, the reviewed

evidence suggests that the investment in the digital customs and the tax operations should be accompanied, in a deliberate manner, by the investment in the customs performance management capabilities, given that the customs performance is reported, across the reviewed studies, as a central mediating mechanism rather than as an automatic outcome. Second, the reviewed evidence on the AI adoption suggests that a phased and a risk-managed approach to the artificial intelligence adoption, addressing the cybersecurity, the data privacy, and the algorithmic bias concerns from the outset, would be a prudent policy direction, rather than a rapid and an unmanaged AI deployment. Third, the legal and the institutional evidence reviewed in Section 5.4 suggests that the continuous updating of the Jordanian customs and the electronic transactions legislation, together with the strengthening of the inter-agency coordination, represents a necessary, and not merely a desirable, complement to the technological investment. Fourth, the human-capital evidence reviewed in the present paper suggests that the training and the digital skills development of the customs and the tax officials should be treated as a core component of the digital transformation strategy, rather than as a secondary consideration. It should be noted, in accordance with the general cautious tone of the present review, that these implications are derived from the reviewed evidence and represent, at this stage, the reasoned recommendations of the author rather than the directly tested policy interventions.

10. LIMITATIONS

This paper review is subject to a number of the limitations, and the most important of these limitations have already been stated, in an explicit manner, in Section 3.6. First, the present review did not have a direct, a licensed access to the Scopus and the Web of Science raw export files at the time of the preparation of the present paper, and, consequently, the formal PRISMA record counts and the VOSviewer/Bibliometrix network analyses could not be generated; the descriptive bibliometric profile presented in Section 4 should be understood as a transparent and a manually constructed approximation of a formal bibliometric analysis, rather than as a substitute for it. Second, the reviewed corpus, while verified against the publisher pages and the DOI records where available, is concentrated within a specific and a closely related regional research network, centred on the Jordan Customs Department and on the Tanmeah Bassmah publishing platform, and it does not represent an exhaustive census of the international literature on the digital customs and the tax operations; a broader search, conducted directly within the Scopus and the Web of Science interfaces, would likely identify the additional relevant studies not captured in the present corpus. Third, several of the numerical findings cited from the individual studies (for example, the clearance efficiency improvement reported by Mzughulga, 2026) are reported as stated in the original sources and have not been independently re-analysed by the author of the present review. Fourth, the proposed conceptual framework presented in Section 7 has not been empirically tested within the present paper, and it should be regarded, at this stage, as a conceptual proposition derived from the reviewed literature.

11. CONCLUSION

The present paper conducted a systematic and a PRISMA-informed literature review, complemented by a descriptive bibliometric profile, of the literature on the AI-enabled digital customs and the tax operations for the sustainable customs performance, with a particular focus on the position of Jordan. The reviewed evidence indicates that the digital customs and the tax operations, and the artificial intelligence and the related emerging technologies, are positively associated with the customs performance and, through the customs performance, with the sustainability outcomes, although this association is conditional on the institutional, the legal, the cybersecurity, the data-governance, and the human-capital factors, and although the causal evidence remains, at the present stage, limited to the

cross-sectional and mostly regional evidence. Jordan is found to occupy an emerging and a growing, but still a developing, position within this literature, with a dedicated and a first-hand line of the empirical studies conducted within the Jordan Customs Department, together with a smaller line of the legal and the institutional studies examining the adequacy of the Jordanian legislation for supporting the digital customs transformation. The paper identified ten research gaps, proposed a conceptual framework linking the digital and the AI capabilities, the customs performance, and the sustainability, and it developed a ten-priority future research agenda. It is recommended, before the final submission of the present paper for the publication, that the corresponding author reproduces the search strategy directly within the Scopus and the Web of Science databases and conducts a full VOSviewer or Bibliometrix analysis, in order to complete the formal bibliometric requirements that could not be fully satisfied within the scope of the present preparation.

Acknowledge

The authors are grateful to the Deanship of scientific research at Jadara University for providing financial support for this publication.

REFERENCES

- Al Mansoori, M. E. M., & Hafssa, Y. (2025). The impact of strategic flexibility and risk management on improving management and competitive advantage in the UAE energy sector as a model. *International Journal of Pedagogy and Professional Human Development Insights*, 1(2).
- Al Matrooshi, M. A. M., AlZageba, M. A., & Hamid, S. A. (2025). VAT revenues as a mediator between tax evasion and the UAE economy. *International Journal of Digital Accounting and Fintech Sustainability*, 2(2). <https://doi.org/10.70568/IJDAFS.2.2.1>
- Al Rousan, S. R. (2024). Green human resource management towards digital transformation in municipalities in Irbid Governorate. *International Journal of Digital Accounting and Fintech Sustainability*, 1(1), 2–12. <https://doi.org/10.70568/IJDAFS.1.1.3>
- Alazzam, F., Gharaibeh, Z., Jarah, B., AlJabali, A., & Al-Zaqeba, M. (2026). Legal and cybersecurity challenges of integrating artificial intelligence and the Internet of Things in financial institutions in the United Arab Emirates and Jordan. *International Journal of Data and Network Science*, 10(1), 265–272. <https://doi.org/10.5267/j.ijdns.2025.9.021>
- Alhadab, Y., Ali, R., & Sapar, R. (2025). Corporate governance determinants of bank profitability and market valuation in Jordan. *International Journal of Digital Accounting and Fintech Sustainability*, 2(2).
- Al-Jabali, K. H., Al-Zaqeba, M. A. A., Alsmadi, K. M. N., Jarah, B. A. F., Ineizeh, I. N., & Hanandeh, T. S. (2026, April). The impact of artificial general intelligence on ESG performance: Through smart taxes and smart customs. In *2026 International Conference on Artificial Intelligence for Sustainable Engineering and Innovation (AISEI)* (pp. 1063–1072). IEEE.
- Al-Jahmani, S. M., et al. (2025). Jordan's journey toward excellence in digital customs: Legal adequacy and institutional requirements. [Working paper / conference contribution as compiled in the author's source corpus].
- Al-Jarrah, M. F. M., Al Badarin, A. M., & Al-Zaqeba, M. A. A. (2024). Factors affecting Jordanian Islamic banks towards competitive advantage. *Journal of Project Management*, 9(4), 311–322. <https://doi.org/10.5267/j.jpjm.2024.9.002>
- Al-Omaria, A. I. M., Zaqeba, M., Hamid, S. A., & Joharid, F. B. (2025). The mediating role of tax awareness in the relationship between digital transformation and sustainable tax compliance. *Universal Journal of Green Human Resources and Sustainable Humanities*, 2(1).
- Aloqaily, A. (2023). The impact of human resources employment strategy in achieving competitive advantage: Zain Jordan Telecom company. *Uncertain Supply Chain Management*, 11(2), 651-656.
- Aloqaily, A. N., Qawasmeh, E. F., Masa'd, F. M., Alrousan, A., & Al-Zaqeba, M. A. A. (2024). The mediating effect of green culture on the relationship between GHRM and green sustainable performance in Jordanian SME logistics companies. *International Journal of Advanced and Applied Sciences*, 11(10), 232–240.

- AL-Qaraleh, Q. K. M. (2025). The effect of talent management on the smart organization in Jordan Customs. [As compiled in the author's source corpus].
- Al-Qasmi, A. (2024). Navigating the digital transformation in higher education: Opportunities, challenges, and strategic pathways. *Universal Journal of Future Intelligence: Innovations and Artificial Intelligence*, 1(4). <https://doi.org/10.70568/UJFIIAI.1.4.24>
- Alqudaha, A. H. A., Sharoma, N. Q. B., & Abd Aziza, S. B. (2025). The effect of green human resource management practices on organizational health: The mediating role of competitive advantage in Jordanian Free and Development Zones Group. *Universal Journal of Green Human Resources and Sustainable Humanities*, 2(1).
- Al-Refai, O., Al-Zaqeba, M. A. A., & Jarah, B. A. F. (2026). The mediating role of green innovation in Islamic banking between green finance and green sustainability performance. *International Journal of Energy Economics and Policy*, 16(2), 843.
- Alseikh, A. S. H., Al-Zaqeba, M. A. A., & Muhammad, I. (2026). The role of artificial intelligence in reducing tax evasion: An implementation strategy. *Corporate and Business Strategy Review*, 7(1), 112–122. <https://doi.org/10.22495/cbsrv7i1art10>
- Alshehadeh, A. R., Al-Zaqeba, M. A. A., Elrefae, G. A., Al-Khawaja, H. A., & Aljawarneh, N. M. (2024). The effect of digital zakat and accounting on corporate sustainability through financial transparency. *Asian Economic and Financial Review*, 14(3), 228.
- Alshehadeh, A. R., Al-Zaqeba, M. A. A., Jaradat, M. S., Alkhawaja, H. A., & Hatamleh, H. (2025). The impact of the Internet of Things on the creative accounting practice using big data. *International Journal of Data and Network Science*, 9(4), 1129–1140.
- Alshehadeh, A. R., Al-Zaqeba, M., Qtaishat, A., Al-khawaja, H., & Al-Wreikat, E. (2025). Digitalization and sustainable development goals: Enhancing electronic financial reports quality in banking. *Data and Metadata*, 4, 734. <https://doi.org/10.56294/dm2025734>
- Alshura, M. S. K., et al. (2023). Authentic leadership and its effect on sustainable performance: The mediating role of knowledge capability in the Jordan Customs Department. [As compiled in the author's source corpus].
- Alsmadi, K. M. N., Salleh, S. B., & Laili, N. H. B. (2025). An AI-based analytical approach: Corporate governance and dividend decisions in Jordan. *Universal Journal of Future Intelligence: Innovations and Artificial Intelligence*, 2(2). <https://doi.org/10.70568/UJFIIAI.2.2.6.25>
- Altaamneh, Y., Al-Zaqeba, M. A. A., Jarah, B. A. F., AlJabali, A. M. A., & Alazzam, F. A. F. (2026). Digital service transformation and FinTech adoption in banking: Implications for operational performance in Jordan. *Journal of Logistics, Informatics and Service Science*, 13(7), 192–206. <https://doi.org/10.33168/JLISS.2026.0712>
- Al-Taani, A. H. M., Al-Zaqeba, M. A. A., Al-Khawaja, H. A., Shubailat, O. M., Elhesenat, L. A., & Al-Rashdan, M. T. (2025). The influence of tax and customs policies on the success of supply chains: Evidence from Jordan. *International Journal of Advanced and Applied Sciences*, 12(9), 241–251. <https://doi.org/10.21833/ijaas.2025.09.024>
- Al-Taani, A. H. M., Al-Zaqeba, M. A. A., Maabreh, H. M. A., & Jarah, B. A. F. (2024). Exploring the impact of digital accounting and digital zakat on improving business sustainability in the Middle East and Malaysia. *International Journal of Advanced and Applied Sciences*, 11(1), 56–67.
- AlZakwani, M. H. H., Al-Zaqeba, M. A. A., Bashatweh, A. D., Al-refai, O., & Abdo, K. K. (2025). The effect of sustainable development goals and fintech adoption on financial reports quality in Jordanian Islamic banks. *International Journal of Innovative Research and Scientific Studies*, 8(1), 1748–1759.
- Al-Zaqeba, M. A. A. (2024). Taxation and customs strategies towards enhancing environmental responsibility. In N. Mansour & L. M. Bujosa Vadell (Eds.), *Green finance and energy transition (Contributions to Finance and Accounting)*. Springer. https://doi.org/10.1007/978-3-031-75960-4_53
- Al-Zaqeba, M. A. A. (2025). Tax and customs strategies towards enhancing environmental responsibility: A bibliographic analysis based on Scopus. [As compiled in the author's source corpus].
- Al-Zaqeba, M. A. A., & Basheti, I. A. (2024). Measurement problems in interest-free financial instruments. *Pakistan Journal of Life and Social Sciences*, 22(1), 5558–5575.
- Al-Zaqeba, M. A. A., Abdul Hamid, S., Khairi, K. F., Mursidi, A., & Ibrahim, I. (2025). Investigating value-added tax and customs duties on retail supply chains in clothing industry. In B. Alareeni (Ed.), *Big data in finance: Transforming the financial landscape (Vol. 1, pp. 15–23)*. Springer. https://doi.org/10.1007/978-3-031-75095-3_2

- Al-Zaqeba, M. A. A., Alshehadeh, A. R., Al-Khawaja, H. A., Basheti, I. A., & Lootah, R. E. S. A. (2024). The role of inheritance risk management in family enterprises to achieve family businesses sustainability in the Middle East. *Humanities and Social Sciences Letters*, 12(3), 639–658.
- Al-Zaqeba, M. A. A., Hamid, S. A., Khairi, K. F., Mursidi, A., & Melhem, I. (2025). The effect of customs duties and value-added tax on the clothing industry and retail supply chains in Dubai. *International Journal of Digital Accounting and Fintech Sustainability*, 2(1). <https://doi.org/10.70568/IJDAFS.2.1.1>
- Al-Zaqeba, M. A. A., Hamid, S. A., Mohammad, H. B., Jamil, N. N. B., & Muhammad, I. (2026). Taxation and accounting policies on green industry sustainability: A systematic literature review. In A. R. Alshehadeh, I. A. El-Qirem, & G. A. Elrefae (Eds.), *Artificial intelligence in business (Lecture Notes in Networks and Systems*, Vol. 1502, pp. 327–336). Springer. https://doi.org/10.1007/978-3-031-96622-4_30
- Al-Zaqeba, M. A. A., Pitchay, S. A., & Hamid, H. A. (2026, April). AI-enabled adaptive learning for workforce-ready: A bibliometric analysis using VOSviewer. In *2026 International Conference on Artificial Intelligence for Sustainable Engineering and Innovation (AISEI)* (pp. 263–271). IEEE.
- Al-Zaqeba, M. A., Aloqaily, A. N., & Al-khawaja, H. A. (2025). The effect of implementing AI-driven customs. In *Artificial intelligence in business: Applications and ethical considerations in the digital age. Proceedings of the 19th SICB* (Vol. 1, p. 105).
- Al-Zaqeba, M. A., Aloqaily, A. N., Al-khawaja, H. A., Jebri, I., Aburub, F., Qtaishat, A. K., & Hanandeh, T. S. (2025, April). The effect of implementing AI-driven customs processes on trade facilitation efficiency in Jordan. In *Conference on Sustainability and Cutting-Edge Business Technologies* (pp. 105–117). Springer. https://doi.org/10.1007/978-3-031-96622-4_11
- Alzeyoudi, M. A. R. K., & Inezeh, N. I. A. A. (2025). The impact of artificial intelligence on innovation: The moderating role of digital infrastructure in the UAE. *Universal Journal of Future Intelligence: Innovations and Artificial Intelligence*, 2(2). <https://doi.org/10.70568/UJFIIAI.2.2.1>
- Amayreh, M. S., Al-Zaqeba, M. A. A., Al-Sheyyab, K. O., Aloqaily, A. N., Jarah, B. A. F., & Al-Jamal, W. Q. (2026, April). Legal and economic perspectives under Malaysia's MADANI framework: ESG and AI. In *2026 AISEI* (pp. 423–431). IEEE.
- Ananzeh, H. (2024). The evolution of corporate governance in Jordan: A study of pre- and post-2017 reforms. *International Journal of Digital Accounting and Fintech Sustainability*, 1(2). <https://doi.org/10.70568/IJDAFS.1.2.3>
- Antov, M., Zhelev, Z., Kostova, S., & Zheleva, A. (2026). Digital transformation and administrative coordination under the new EU customs reform: The case of post-clearance control in Bulgaria. [As compiled in the author's source corpus].
- Bilenko, O., & Horban, S. (2026). Reform of customs procedures in Ukraine in line with EU standards and its effect on clearance time, logistics costs, and transparency of foreign economic activity. [As compiled in the author's source corpus].
- Darabee, H. S. A., Al-Zaqeba, M. A. A., Muhamed, N. A. B., & Nasir, N. L. F. B. M. (2026, April). The role of digital technologies and artificial intelligence in improving government financial performance. In *2026 AISEI* (pp. 439–448). IEEE.
- Elagha, T. B. J., Al-Zaqeba, M. A. A., & Bin, M. A. (2025). The moderating effect of family ownership concentration between board of directors effectiveness and risk management disclosure in Palestine Stock Exchange. *International Journal of Digital Accounting and Fintech Sustainability*, 2(2). <https://doi.org/10.70568/IJDAFS.2.1.2>
- Elhesenat, L. A. D. A., Zaqeba, M. A., Yaakub, N. A., & Hamid, S. A. (2025). The effect of customs and tax digital operations on Jordanian customs performance towards sustainability. *International Journal of Digital Accounting and Fintech Sustainability*, 2(2). <https://doi.org/10.70568/IJDAFS.2.1.4>
- Frick, J., & Steger-Jensen, K. (2024). Enhancing logistics performance: The integration of ports, customs clearance, digital transformation, and the European product passport. [As compiled in the author's source corpus].
- Gutium, M. (2025, July). Digital transformation of customs administration: Using artificial intelligence and big data to improve customs service efficiency. [As compiled in the author's source corpus].
- Hazaimah, Z. D. K. (2025). The degree of vocational education teachers' utilization of digital skills from their perspective in Qasabat Irbid. *International Journal of Pedagogy and Professional Human Development Insights*, 2(1). <https://doi.org/10.70568/IJPPHDI.2.1.625.1>

- Ibrahim, I., & Ali, K. (2025). Constructive debate: Is it employee turnover or displacement by artificial intelligence? *Universal Journal of Future Intelligence: Innovations and Artificial Intelligence*, 2(1). <https://doi.org/10.70568/UJFIIAI.2.1.6.25>
- Ibrahim, I., Alsuraihi, W. A., & Zaqeba, M. (2025). Conceptual model development of nexus between agile human resource management practices and employee's empowerment: Contemporary perception. *Universal Journal of Green Human Resources and Sustainable Humanities*, 1(2), Article 4. <https://doi.org/10.70568/UJGHRSH.1.2.2025.4>
- Ibrahima, I. (2025). Employee turnover: Diversity of predictors, consequences and retention variables in different continents. *Universal Journal of Green Human Resources and Sustainable Humanities*, 2(2). <https://doi.org/10.70568/UJGHRSH.2.2.1>
- Ineizeh, N. I. A. A. (2025). The ethics of artificial intelligence: Challenges, dimensions, and prospects for responsible use. *Universal Journal of Future Intelligence: Innovations and Artificial Intelligence*, 2(2). <https://doi.org/10.70568/UJFIIAI.2.2.2>
- Ineizeh, N. I., Al-Zaqeba, M. A. A., Pitchay, S. A., Hamid, S. A., Muhammad, I., & Khairi, K. F. (2026, April). Artificial intelligence and FinTech for sustainable financial systems: A systematic review. In 2026 AISEI (pp. 184–190). IEEE.
- Issaa, A. B. I. (2024). Exploring the transformative impact of AI across industries and its role in shaping global advancements. *Universal Journal of Future Intelligence: Innovations and Artificial Intelligence*, 1(1), 1–8.
- Jaleta, M. E. (2023). Digital transformation in logistics and customs: The digital maturity model as a comprehensive assessment framework. [As compiled in the author's source corpus].
- Jebail, I., Al-Zaqeba, M., Al-Khawaja, H., Obaidy, A., & Marashdah, O. (2024). Enhancing estate governance using blockchain technology through risk management in estate governance of business sustainability. *International Journal of Data and Network Science*, 8(3), 1649–1658.
- Khairi, K. F., Laili, N. H., & Al-Zaqeba, M. A. A. (2024). Enhancing estate governance through blockchain: An analysis of transparency, efficiency and security in estate management. *Humanities and Social Sciences Letters*, 12(3), 703–722. <https://doi.org/10.18488/73.v12i3.3878>
- Lahuri, S. B., Muhammad, I., Khotimah, H., Zuhroh, A. A., & Al-Zaqeba, M. A. (2025). Determinants of zakat payment attitude and its impact on Muslims' acceptance of zakat as a tax deduction: Evidence from Indonesia. *Journal of Islamic Accounting and Business Research*. Advance online publication. <https://doi.org/10.1108/JIABR-05-2025-0252>
- Lootah, R. E. A. (2024). The impact of blockchain technology on financial reporting practices in UAE. *International Journal of Digital Accounting and Fintech Sustainability*, 1(1), 2–12. <https://doi.org/10.70568/IJDAFS.1.1.1>
- Maabreh, H. M. A. (2024). The role of financial technology (fintech) in promoting financial inclusion: A literature review. *International Journal of Digital Accounting and Fintech Sustainability*, 1(1), 2–12. <https://doi.org/10.70568/IJDAFS.1.1.2>
- Mohammad, N., & Daud, N. M. (2026). Digital customs technology, employee performance, and tax collection efficiency: An integrated socio-technical framework. [As compiled in the author's source corpus].
- Monsalve, L. F. J., et al. (2026a). Strategic factors of business competitiveness in international trade: Digital transformation, supply chain improvement, and customs legislative change. [As compiled in the author's source corpus].
- Monsalve, L. F. J., et al. (2026b). The impact of supply chain resilience: Regional trade diversification and improved supplier selection in emerging markets amid tariff volatility (2020–2025). [As compiled in the author's source corpus].
- Mzughulga, J. I. (2026). Improving customs clearance procedures for international logistics companies. [As compiled in the author's source corpus].
- Nsour, M. F. (2025). Pre-arrival processing in Jordan under the WTO Trade Facilitation Agreement. [As compiled in the author's source corpus].
- Othman, A. A. A., Bin Jalil, A., & Bin Sabri, H. (2024). The impact of Islamic finance contracts and modes on sustainable economic development. *International Journal of Digital Accounting and Fintech Sustainability*, 1(2), 1–15. <https://doi.org/10.70568/IJDAFS.1.2.2>
- Qahman, A. I. A., & Abdu, M. (2024). Addressing ethical considerations, governance, and societal impacts in AI development and application. *Universal Journal of Future Intelligence: Innovations and Artificial Intelligence*, 1(3). <https://doi.org/10.70568/UJFIIAI.1.3.24>

- Qahman, A. I. A., Al-Zaqeba, M. A. A., Jarah, B. A. F., Al-Kharbsheh, A., & Assaf, N. (2025). An improving of green supply chain performance using green digital learning and artificial intelligence integration. *International Journal of Innovative Research and Scientific Studies*, 8(1), 1874–1889.
- Qahman, A. I. A., Dahlan, H. A., Alzakwani, M. H. H., & Al-Zaqeba, M. A. A. (2025). AI adoption criteria for adaptive e-learning systems in conflict zones: Insights from Palestinian schools. *Espacio, Tiempo y Educación*, 12(2).
- Qahman, A., Alzaqebah, M., Jawarneh, S., Al-Zaqeba, M., Al-Taani, A., Aloqaily, A., & Almatrooshi, M. (2026). Design and development of an intelligent system based on artificial intelligence and machine learning using customs digital indicators. *International Journal of Data and Network Science*, 10(1), 251–264. <https://doi.org/10.5267/j.ijdns.2025.9.022>
- Sharadgah, R. A. M., Al-Shaboul, T. A., & Hazaimah, Z. D. (2025). The role of digital transformation on the performance of vocational education teachers in public schools in Irbid Governorate from their perspective. *International Journal of Pedagogy and Professional Human Development Insights*, 2(1). <https://doi.org/10.70568/IJPPHDI.2.1.625>
- Shatnawi, M., Masadeh, A., Alsawalhah, J., & Al-Zaqeba, M. (2024). Corporate environmental responsibility and corporate performance in Jordan. *Uncertain Supply Chain Management*, 12(1), 307–314. <https://doi.org/10.5267/j.uscm.2023.9.020>
- Shboul, T. (2024). Adopting the BTEC framework in vocational education: A pathway to elevating employability skills and meeting labor market needs. *International Journal of Pedagogy and Professional Human Development Insights*, 1(1), Article 424. <https://doi.org/10.70568/IJPPHDI.1.1.424>
- Shehab, M. (2025). Artificial intelligence in accountancy: Skills evolution, ethical challenges and future directions in digital economy. *Universal Journal of Future Intelligence: Innovations and Artificial Intelligence*, 2(2). <https://doi.org/10.70568/UJFIIAI.2.2.6.25.1>
- Shubailat, O. M., Al-Zaqeba, M. A. A., Madi, A., & Hamid, S. A. (2024, April). The effect of customs strategies on environmental and sustainable responsibility of Jordanian supply chain management. In *International Conference on Business and Technology* (pp. 309–322). Springer.
- Shubailat, O., Al-Zaqeba, M., Madi, A., & Khairi, K. (2024). Investigating the effect of digital taxation and digital accounting on customs efficiency and port sustainability. *International Journal of Data and Network Science*, 8(1), 61–68. <https://doi.org/10.5267/j.ijdns.2023.10.017>
- Shubailat, O., Madi, A., Al-Zaqeba, M. A. A., & Alown, B. (2025). A strategic approach to family connectedness and entrepreneurial intentions. *Corporate & Business Strategy Review*, 6(3), 160–169. <https://doi.org/10.22495/cbsrv6i3art15>
- Tariq, S., Khan, S. A., Javed, A., & AlOtaibi, F. (2026). Digital transformation in ports and sustainable performance outcomes: The moderating effect of customs procedure modernization. [As compiled in the author's source corpus].
- Thosony, J. R. (2025). Global finance transformation driven by AI: Reshaping the future with fintech and emerging technologies. *Universal Journal of Future Intelligence: Innovations and Artificial Intelligence*, 2(2). <https://doi.org/10.70568/UJFIIAI.2.2.6.25.3>
- Wongi, T. A. (2025). Determinants of tax compliance with implications for digital accounting and fintech sustainability. *International Journal of Digital Accounting and Fintech Sustainability*, 2(1). <https://doi.org/10.70568/IJDAFS.2.1.5>
- Zablah, S., Al-Zaqeba, M. A. A., Ineizeh, N. I., & Sabri, H. (2026, April). The role of artificial intelligence in economic transformation at Palestinian universities: Al-Istiqlal University as a case study. In *2026 AISEI* (pp. 257–262). IEEE.
- Zagibah, A. M. (2025). The role of artificial intelligence in shaping robotics innovation. *Universal Journal of Future Intelligence: Innovations and Artificial Intelligence*, 2(2). <https://doi.org/10.70568/UJFIIAI.2.2.6.25.2>
- Zaqeeba, N. (2024). The scope of AI applications to tax evasion in enhancing tax enforcement capabilities. *International Journal of Digital Accounting and Fintech Sustainability*, 1(2), 2–16. <https://doi.org/10.70568/IJDAFS.1.2>

APPENDIX: SUPPLEMENTARY TABLES

A1. Selected Included Studies

Study	Context	Method	Focus / key relationship
Elhesenat et al. (2025)	Jordan	Quantitative, PLS-SEM	Digital customs/tax operations → customs performance → sustainability
Al-Taani et al. (2025)	Jordan	Quantitative, SEM-PLS4	Tax/customs policy → supply chain success (moderated by sustainable practices)
Shubailat et al. (2024)	Jordan	Quantitative, PLS	Customs intelligence, risk management → sustainable supply chain → logistics efficiency
Al-Zaqeba et al. (2025)	Jordan	Quantitative, PLS-SEM	AI-driven customs processes → trade facilitation efficiency
Al-Zaqeba (2025)	Bibliographic/Scopus-based	Bibliographic analysis	Tax/customs strategies → sustainable practices → environmental responsibility
Qahman et al. (2026)	Jordan	AI/ML model development	Customs digital indicators-based intelligent system
Alseikh et al. (2026)	Palestine	Quantitative survey	AI predictive analytics/automated auditing → tax compliance
Al-Jahmani et al. (2025)	Jordan	Legal/doctrinal analysis	Legal adequacy for e-customs transition
Nsour (2025)	Jordan	Qualitative case study	Pre-arrival processing under WTO TFA
Bilenko & Horban (2026)	Ukraine	Structural/statistical analysis	EU-aligned customs reform → clearance time, transparency
Antov et al. (2026)	Bulgaria	Quantitative survey (χ^2 , Fisher, Cramér's V)	Digital coordination → post-clearance control effectiveness
Tariq et al. (2026)	Pakistan	Quantitative, SEM	Smart port practices → sustainable port performance (moderated by customs modernization)
Mzughulga (2026)	General/logistics firms	BPR + logistic regression	Process re-engineering → customs clearance efficiency

Table A1. Overview of a selection of the key included studies (illustrative subset of the 65-record corpus).

A2. Theories Used in the Reviewed Literature

Theory	Illustrative studies
Resource-based view / dynamic capabilities	Elhesenat et al. (2025)
Agency theory	Elhesenat et al. (2025); Zaqeeba (2024)
Technology acceptance model / UTAUT	Jaleta (2023); Mohammad & Daud (2026)
Institutional theory	Antov et al. (2026); Tariq et al. (2026)
Business process re-engineering / systems thinking	Mzughulga (2026)

Table A2. Theoretical foundations identified in the reviewed literature.

A3. Technologies Examined

Technology	Illustrative studies
Artificial intelligence / machine learning (risk assessment, predictive analytics, fraud detection)	Al-Zaqeba et al. (2025); Qahman et al. (2026); Zaqeeba (2024); Alseikh et al. (2026)
Big data analytics	Alshehadeh et al. (2025); Gutium (2025)
Blockchain	Khairi et al. (2024); Jebri et al. (2024)
E-invoicing / electronic government	Elhesenat et al. (2025); Wongi (2025)
Artificial general intelligence	Al-Jabali et al. (2026); Al-Zaqeba, Pitchay, & Hamid (2026)
Smart port / IoT digital platforms	Tariq et al. (2026)

Table A3. Technologies examined in the reviewed literature.

A4. Research Methods Used

Method	Illustrative studies
Quantitative survey with PLS-SEM / SEM	Elhesenat et al. (2025); Al-Taani et al. (2025); Shubailat et al. (2024); Al-Zaqeba et al. (2025); Tariq et al. (2026)
Bibliographic / bibliometric analysis	Al-Zaqeba (2025); Al-Zaqeba, Pitchay, & Hamid (2026)
Qualitative case study / interviews	Nsour (2025)
Legal / doctrinal analysis	Al-Jahmani et al. (2025)

Structural / statistical comparative analysis	Bilenko & Horban (2026)
Business process modelling (BPMN) and logistic regression	Mzughulga (2026)
Machine learning model development	Qahman et al. (2026)

Table A4. Research methods used in the reviewed literature.

A5. Sustainability Dimensions Addressed

Sustainability dimension	Illustrative studies
Economic sustainability (revenue performance, trade competitiveness)	Al-Taani et al. (2025); Nsour (2025)
Operational sustainability (efficiency, transaction cost)	Elhesenat et al. (2025); Mzughulga (2026)
Environmental sustainability (physical inspection, paper reduction)	Al-Zaqeba (2025); Shubailat et al. (2024); Tariq et al. (2026)
Institutional sustainability (transparency, reduced corruption risk)	Bilenko & Horban (2026); Antov et al. (2026)

Table A5. Sustainability dimensions addressed in the reviewed literature.

A6. Dependent and Independent Variables

Variable role	Illustrative variables
Independent	Digital customs/tax operations, AI-driven customs processes, tax/customs policy, customs intelligence, risk management, smart port practices
Mediating	Customs performance, sustainable supply chain practices, trade facilitation efficiency
Moderating	Sustainable practices adoption, institutional modernization/customs modernization
Dependent	Sustainability (economic, operational, environmental, institutional), supply chain success, tax compliance, port sustainable performance

Table A6. Dependent, independent, mediating, and moderating variables identified in the reviewed literature.

A7. Jordan-Related Studies

Study	Jordanian context	Focus
Elhesenat et al. (2025)	Jordan Customs Department	Digital operations → customs performance → sustainability
Al-Taani et al. (2025)	Jordan Customs clearance/logistics companies	Tax/customs policy → supply chain success
Al-Zaqeba (2024)	Jordan Customs Department	Customs policy → supply chain success
Al-Zaqeba et al. (2025)	Jordan trade facilitation professionals	AI-driven customs → trade facilitation efficiency
Al-Jahmani et al. (2025)	Jordanian customs/electronic-transactions law	Legal adequacy for e-customs
Al-Zaqeba (2025)	Jordan / Scopus-based bibliographic review	Tax/customs strategy → sustainability
Shubailata et al. (2024)	Jordan Customs Department	Customs intelligence, risk management → sustainable supply chain
Nsour (2025)	Jordan (WTO TFA)	Pre-arrival processing implementation
Alshura et al. (2023)	Jordan Customs Department border centres	Authentic leadership → sustainable performance via knowledge capability
AL-Qaraleh (2025)	Jordan Customs Department	Talent management → smart organization

Table A7. Studies conducted directly within the Jordanian customs and tax context.