

Intellectual Capital and Customs Service Quality: A Theoretical Framework in the Context of SDGS

Firas Nawwaf Barhoom^{1*}, Khaw Khai Wah², Alhamzah Alnoor³

^{1,2}School of Management, Universiti Sains Malaysia, Penang, Malaysia, ³College of Business Administration, A'Sharqiyah University, Ibra, Oman, Management Technical College, Southern Technical University, Basrah, Iraq

*Corresponding Author Email: firmasbarhoom@student.usm.my

DOI Link: <http://dx.doi.org/10.6007/IJAREMS/v14-i3/26468>

Published Online: 30 September 2025

Abstract

Objective: This study investigates the role of intellectual capital in improving the quality of customs services, with a particular focus on the MENA region. It proposes a conceptual framework that incorporates internal audit as a mediating factor and regulatory frameworks as moderating variables. **Theoretical Framework:** The study is grounded in the SERVQUAL model, a widely recognized tool for evaluating service quality. It also draws on theories of human capital development, knowledge management, and institutional performance. Intellectual capital is conceptualized through three key dimensions: human, structural, and relational capital, each relevant to the customs context. **Method:** An integrative literature review was conducted, analyzing 33 peer-reviewed studies published between 2013 and 2024. The review synthesizes existing findings to identify theoretical and practical gaps related to intellectual capital and service quality in customs institutions. **Findings:** Human capital improves reliability and assurance through employee development; structural capital enhances responsiveness and transparency via digital transformation; relational capital supports empathy and trust through stakeholder engagement. Internal auditing mediates this relationship by promoting accountability, while regulatory frameworks moderate it based on institutional flexibility. **Implications:** The proposed conceptual framework provides strategic insights for policymakers and customs managers aiming to enhance service performance. It also offers a foundation for future empirical studies using structural equation modeling (SEM). **Originality/Value:** This research addresses a notable gap in the literature by focusing on intellectual capital in the underexplored context of customs administrations, especially within the MENA region.

Keywords: Intellectual Capital, Customs Service Quality, SERVQUAL, Human Capital, Internal Audit, Regulatory Framework

Introduction

The customs sector constitutes a cornerstone of national economies by regulating international trade, protecting domestic markets, and enforcing trade laws to ensure economic and financial security (Petruk et al., 2022). In recent years, customs administrations

have also played a growing role in advancing sustainable development by facilitating trade, enhancing transparency, and supporting international cooperation aligned with the Sustainable Development Goals (SDGs) (Barhoom et al., 2025c).

Nevertheless, customs institutions face mounting challenges in the face of globalization, the expansion of e-commerce (Al Oraini et al., 2024; Barhoom et al., 2025a), and increasing regulatory complexity (Barhoom et al., 2025a). These pressures have exposed systemic weaknesses such as outdated bureaucratic procedures, insufficient technological infrastructure (Barhoom et al., (2025b), limited human capital, and weak inter-agency coordination (Parthiban et al., 2020; Dionysopoulou et al., 2021; Ayarza, 2022). These institutional limitations hinder the provision of efficient, reliable, and transparent customs services that meet modern expectations and development goals (Maayah et al., 2025; Barhoom et al., 2025c).

In this context, intellectual capital has emerged as a key strategic resource for improving public sector performance. Defined as the sum of an organization's intangible assets namely, human, structural, and relational capital, intellectual capital contributes to knowledge creation, innovation, and institutional effectiveness (Khoshnaw & Karadaş, 2024; Asutay & Ubaidillah, 2024).

Enhancing customs service quality through improved reliability, responsiveness, assurance, and transparency is essential for facilitating trade and achieving efficient governance (Abdolvand & Taghipouryan, 2011; Lawrence & Mupa, 2024). Yet, despite increasing scholarly interest in intellectual capital, few studies have examined its specific application within the customs sector, particularly in connection to service quality models like SERVQUAL.

To address this gap, the present study conducts an integrative literature review to explore how intellectual capital contributes to improving customs service quality. Building on the SERVQUAL framework and related theories, the study develops a conceptual model that incorporates internal audit as a mediating factor and regulatory frameworks as a moderating variable. This model aims to guide both future empirical research and strategic policymaking in the customs context, especially within MENA-region institutions.

Methodology

This study adopted an integrative literature review approach based on the framework proposed by Whitemore and Knafl (2005). The review process included five stages: (1) problem identification, (2) literature search, (3) data evaluation, (4) data analysis, and (5) presentation of results. This method enables the synthesis of empirical and theoretical literature to generate a comprehensive understanding of the topic.

Search Strategy

A systematic search was conducted across four major databases: Google Scholar, Scopus, Web of Science, and ProQuest, covering the period from 2013 to 2024. Search terms included combinations of keywords such as: "intellectual capital," "customs sector", "service quality", "knowledge management", "SERVQUAL", and "institutional performance". In addition to

database queries, reference lists of relevant studies were manually reviewed to ensure comprehensive coverage.

Inclusion and Exclusion Criteria

The review focused on peer-reviewed English-language studies that examined the relationship between intellectual capital (human, structural, and relational) and service quality. Studies were included if they presented empirical evidence (quantitative or qualitative) or robust conceptual discussions. Articles that were not academic in nature, duplicates, or unrelated to the customs or public sector context were excluded.

Selection Process and Output

The initial search retrieved 285 articles. After title and abstract screening, 64 studies were selected for full-text review. Following further evaluation, 33 studies met the inclusion criteria and were included in the final synthesis. The article selection process followed the PRISMA protocol (Page et al., 2021), as illustrated in Figure 1.

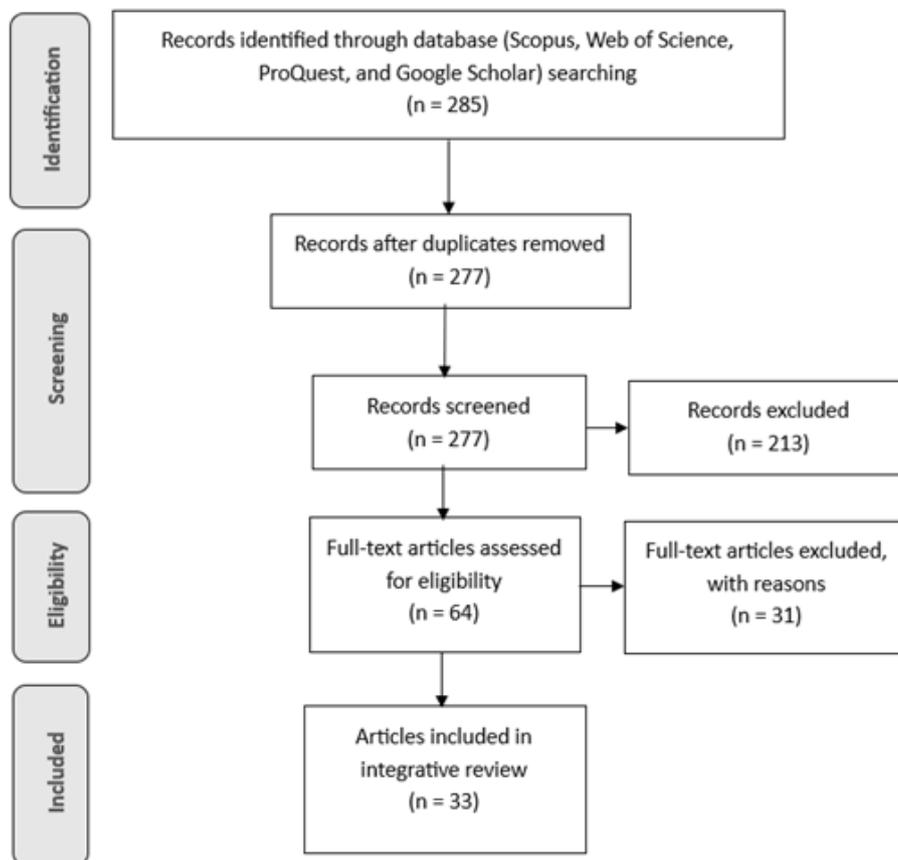


Figure 1: Data collecting using PRISMA Protocol
Source: Page et al. (2021)

Literature Review

Table 1

Summary of Key Empirical Studies on Intellectual Capital and Service Quality (2013–2024)

No.	Study	Sector		Key Findings
1	Khoshnaw & Karadaş (2024)	Customs Sector		The transactional leadership style positively affects the development of intellectual capital among customs employees.
2	Strazzullo et al. (2024)	Public	Higher Education Sector	Intellectual capital has a positive impact on improving research development performance in Italian public universities.
3	Huian et al. (2024)	Public	Research Institutes Sector	Intellectual capital management plays a crucial role in improving technology transfer processes in public research institutes.
4	Hidayah et al. (2023)	Higher	Education Sector	Intellectual capital, including human, structural and relational capital, positively impacts the quality of educational institutions.
5	Nguyen (2023)	Service Firms Sector		Intellectual capital has a positive impact on the financial performance of service companies in developing countries.
6	Ghaleb et al. (2022)	Public	Healthcare Sector	Intellectual capital (human, structural, and relational) plays a major role in improving the quality of service in the public health sector.
7	Abd-Elrahman, & Ahmed Kamal, (2022)	Telecommunication Sector		Relational capital (relationships between companies, customers and partners) has a significant impact on service quality in the telecommunications sector.
9	Kamaruddin & Abeysekera (2021)	Public Sector		Intellectual capital enhances sustainable economic performance in Malaysian government institutions.
10	Akil et al. (2021)	Public Sector		Intellectual capital and knowledge management significantly impact public sector innovation.
11	Wudhikarn et al. (2020)	Logistics	Service Providers Sector	Improving intellectual capital management enhances the strategic performance of logistics service providers.
12	Behaylu & Gizaw (2020)	Banking Sector		Intellectual capital (human, structural, and relational) has a positive impact on the quality of banking services in the Commercial Bank of Ethiopia.
13	Weqar & Haque (2020)	Public Sector		Intellectual capital is positively associated with financial performance of public companies in India.
14	Abd-Elrahman et al. (2020)	Telecommunications Sector		Intellectual capital (human, structural, and relational) has a positive impact on service quality in mobile telecommunications companies in Egypt.
15	Budiarso (2019)	Public Sector		Intellectual capital is an essential element in improving the performance of public institutions and enhancing their operational efficiency.
16	Khan & Nouman (2019)	Public Sector		Intellectual capital is considered an essential element in enhancing efficiency and productivity in government institutions.
17	Alshawabkeh (2018)	Public	Healthcare Sector	Enhancing intellectual capital in health institutions leads to improving efficiency and quality in providing health services.
18	Busenan et al. (2018)	Public Sector		Intellectual capital is a critical element in improving public sector performance, contributing to enhanced efficiency and innovation in government institutions.
19	Riana et al. (2018)	Village	Credit Institutions Sector	Intellectual capital (human, structural, and relational) is the basis for improving service performance in rural credit institutions.

No.	Study	Sector		Key Findings
21	Anggraini et al. (2018)	Public Education Sector	Higher	Intellectual capital has a significant impact on the performance of public universities in Indonesia, by improving the quality of education and research.
22	Cricelli et al. (2018)	Public Education Sector	Higher	Intellectual capital directly affects the performance of public universities in Colombia, which is reflected in the quality of education and scientific research.
23	Indiyati (2018)	Public Sector	Education	Intellectual capital (human, structural, and relational) positively affects the implementation of government policies in the education sector.
24	Braendle et al. (2017)	public sector		There is a positive relationship between corporate governance, intellectual capital and institutional performance in the public sector in the GCC countries.
25	Manes Rossi et al. (2016)	Public Sector		Intellectual capital enhances institutional performance in Italian local governments by improving operational efficiency and quality of public services.
26	Aryee et al. (2016)	Service Sectors		Developing human capital through training and development contributes significantly to improving service quality.
27	Guthrie & Dumay (2015)	Public Sector		Intellectual capital has become a strategic element in improving government performance and providing more efficient public services.
28	Awan & Saeed (2015)	Public Education Sector	Higher	There is a positive relationship between intellectual capital and institutional performance in public universities in South Punjab.
29	Datta (2014)	Public Sector		Intellectual capital is most vital enabler of enterprises. Managing intellectual capital effectively can greatly enhance the competitive advantages of any enterprises.
30	Maria Morariu (2014)	Public Sector		Intellectual capital performance positively affects corporate performance in public companies in Romania.
31	Kamukama (2013)	Microfinance Sector	Industry	Intellectual capital is a hidden source of improving service quality in microfinance institutions.
32	Adnan et al. (2013)	Public Sector		Intellectual capital (human, structural, and relational) plays an important role in improving the performance of zakat institutions in Malaysia.
33	Santos-Rodrigues (2013)	Public Sector	Healthcare	Intellectual capital enhances innovation in public healthcare institutions, leading to improved quality of health services.

Analysis of Previous Studies

The existing literature demonstrates a growing recognition of intellectual capital as a key driver of organizational performance and service quality across various sectors. However, the distribution of research efforts remains uneven, with a strong focus on sectors such as education, healthcare, telecommunications, and finance, while customs administrations have received limited attention.

In the public sector, studies by Braendle et al. (2017), Busenan et al. (2018), and Guthrie and Dumay (2015) examined how intellectual capital management enhances transparency, innovation, and institutional performance. These studies confirm the relevance of intellectual capital to government institutions but do not explore its role in frontline regulatory agencies such as customs. Similarly, Kamaruddin and Abeysekera (2021), Manes Rossi et al. (2016), and

Weqar and Haque (2020) emphasized the importance of knowledge-based investment in improving public service quality but overlooked the specific regulatory and operational characteristics of the customs sector.

Despite the strategic and economic importance of customs administrations, research linking intellectual capital to customs service quality is still limited. One notable exception is the study by Khoshnaw and Karadaş (2024), which investigated the influence of leadership style on intellectual capital development among customs employees in Iraq. However, this study did not address how intellectual capital translates into measurable service quality outcomes, particularly within the dimensions of reliability, responsiveness, and assurance proposed by the SERVQUAL model. This omission represents a significant empirical gap given the increasing demand for performance, efficiency, and transparency in customs services.

In other sectors, the relationship between intellectual capital and service quality has been more thoroughly studied. In the telecommunications industry, research by Abd-Elrahman et al. (2020) and Abd-Elrahman and Ahmed Kamal (2022) demonstrated strong links between relational capital and customer satisfaction, supported by trust and continuous service improvement. However, these results cannot be directly applied to the regulatory and compliance-intensive context of customs services.

In banking and finance, studies by Kamukama (2013), Behaylu and Gizaw (2020), and Riana et al. (2018) revealed that human and structural capital contribute significantly to improving service delivery and institutional performance. While there are some functional similarities between banking and customs, such as compliance monitoring and interaction with clients, the institutional context and legal mandates of customs agencies are distinct and require specialized study.

In the healthcare sector, research by Ghaleb et al. (2022), Alshawabkeh (2018), and Santos-Rodrigues (2013) emphasized the value of human and relational capital in promoting responsiveness, patient satisfaction, and innovation. Yet, these findings do not take into account the procedural control, law enforcement, and inter-agency coordination that define the customs environment.

In education and scientific research, studies by Hidayah et al. (2023), Cricelli et al. (2018), Indiyati (2018), and Anggraini et al. (2018) explored how intellectual capital contributes to innovation, strategic alignment, and stakeholder engagement. These insights may conceptually support customs modernization efforts but lack practical application to customs operations, such as risk profiling, clearance automation, and international regulatory compliance.

Even in logistics and supply chain management, where customs plays a pivotal role, the application of intellectual capital remains peripheral. Wudhikarn et al. (2020) examined intellectual capital in logistics service providers but did not include customs administrations in their analysis, despite their integral role in global trade systems.

Another limitation is the limited use of service quality models, such as SERVQUAL, in analyzing the impact of intellectual capital. Few studies connect intellectual capital dimensions with

concrete service performance indicators. This lack of integration restricts the ability to assess how intellectual capital influences outcomes such as reliability, empathy, responsiveness, or assurance within customs services.

While the existing body of research provides a broad understanding of intellectual capital across various sectors, these findings underscore the need to explore intellectual capital within customs settings. The following section addresses the key research gaps that emerge from this analysis.

Research Gap

The relationship between intellectual capital and organizational performance has been widely studied in sectors such as education, healthcare, banking, and telecommunications, as evidenced by Braendle et al. (2017), Kamukama (2013), and Ghaleb et al. (2022). However, customs administrations remain notably underrepresented in this field. Most studies have focused on private institutions or public organizations with broader mandates, leaving customs-specific operations largely unexplored. This gap is significant, given the critical role customs agencies play in trade facilitation, regulatory compliance, and institutional development.

Although several studies have acknowledged the contribution of intellectual capital to improving service delivery, there is a lack of conceptual and empirical models tailored to the context of customs. Research by Indiyati (2018) and Wudhikarn et al. (2020) demonstrated the utility of intellectual capital frameworks in education and logistics, but such frameworks have not been applied or validated in customs services, where outcomes like transparency, speed, and accuracy are essential.

Another key limitation is the insufficient consideration of cultural and institutional differences, especially in the Middle East and North Africa region. Studies such as those by Abd-Elrahman and Ahmed Kamal (2022) and Behaylu and Gizaw (2020) often generalize findings without acknowledging the political, administrative, and legal characteristics unique to MENA customs environments. These contextual factors likely influence how intellectual capital is developed, utilized, and perceived.

Moreover, the relationship between intellectual capital and innovation, modernization, and digital transformation in customs remains underdeveloped in the literature. While these aspects have been studied in other public institutions such as universities and banks, their relevance to customs, particularly regarding automation, risk analysis, and international cooperation, is still unclear. The work of Strazzullo et al. (2024) and Maria Morariu (2014) highlights these themes in other sectors, but their applicability to customs operations needs further exploration.

The relational dimension of intellectual capital is also overlooked in customs research. Despite the importance of cooperation between customs agencies and external stakeholders like freight forwarders, brokers, and international bodies, few studies assess how relational capital can enhance trust, coordination, and compliance. Hidayah et al. (2023) emphasized relational capital in academic institutions, but a similar empirical investigation in customs is lacking.

Based on this review, several critical gaps can be identified. First, there is a sectoral gap resulting from the limited attention to customs in intellectual capital research. Second, a conceptual gap exists, as few studies connect intellectual capital to established service quality frameworks such as SERVQUAL. Third, the literature reveals a contextual gap due to the lack of studies that consider the specific institutional and regional conditions of customs agencies, particularly in the MENA region. Fourth, there is an empirical gap involving the absence of validated frameworks that link intellectual capital components to measurable performance indicators in customs settings.

In response to these gaps, this study proposes a conceptual model grounded in the SERVQUAL framework. The model integrates intellectual capital dimensions with internal auditing and regulatory frameworks to offer a comprehensive approach to understanding and improving service quality in customs administrations, with specific relevance to the MENA region.

Analytical Framework for Improving the Quality of Customs Services through Intellectual Capital

This framework is grounded in the SERVQUAL model developed by Parasuraman et al. (1988), which identifies five key service quality dimensions: reliability, responsiveness, assurance, tangibles, and empathy. These dimensions serve as the conceptual foundation for assessing how intellectual capital components influence the quality of customs services.

The central premise of the framework is that enhancing service quality in customs administrations depends significantly on the effective deployment of intellectual capital. Intellectual capital comprises three interrelated components: human capital, structural capital, and relational capital. When strategically managed, these components collectively serve as intangible assets that drive responsiveness, innovation, and institutional efficiency (Khoshnaw & Karadaş, 2024).

Human Capital

In the customs context, human capital includes the knowledge, skills, experience, and competencies of employees. Well-trained customs officers, equipped with updated legal, procedural, and digital expertise, can ensure procedural accuracy, reduce transaction delays, and minimize operational errors. These capabilities directly support the SERVQUAL dimensions of reliability and assurance (Nguyen, 2023; Aryee et al., 2016).

Structural Capital

Structural capital consists of internal systems, standardized procedures, policies, databases, and IT infrastructure that form the institutional backbone of customs operations. Efficient structural capital enables seamless workflow integration, reduces procedural complexity, and fosters transparency in decision-making. These outcomes primarily enhance responsiveness and tangibles within service delivery (Wudhikarn et al., 2020).

Relational Capital

Relational capital refers to the quality of interactions and networks between customs administrations and external stakeholders such as traders, freight forwarders, brokers, and governmental bodies. Strong relational capital supports collaboration, mutual trust, and communication efficiency, which are essential for achieving empathy and reliability in customs services (Abd-Elrahman & Ahmed Kamal, 2022; Guthrie & Dumay, 2015).

Integrative Perspective

This framework assumes that each intellectual capital component contributes uniquely and interactively to enhancing key service quality indicators identified by SERVQUAL. Moreover, the framework sets the foundation for subsequent analysis of mediating and moderating variables, particularly internal audit and regulatory frameworks, which influence the effectiveness of intellectual capital in practice.

Overall, the proposed framework offers a structured lens through which customs institutions can assess and improve service quality by strategically investing in and leveraging their intellectual capital assets.

Impact of Intellectual Capital on the Quality of Customs Services According to Servqual

The SERVQUAL model developed by Parasuraman et al. (1988) is one of the most widely adopted frameworks for measuring service quality. It is based on five core dimensions: reliability, responsiveness, assurance, tangibles, and empathy. This section examines how the components of intellectual capital; human, structural, and relational interact with these dimensions to improve customs service quality:

- **Reliability:** This dimension reflects the ability to perform the promised service dependably and accurately. Human capital plays a critical role here, as investing in employee expertise, skills, and institutional knowledge leads to greater precision in customs procedures, reduced errors, and improved compliance with regulations.
- **Responsiveness:** Defined as the willingness to help customers and provide prompt service, this aspect is largely enhanced by structural capital. The adoption of advanced information systems and streamlined organizational processes reduces delays, facilitates real-time communication, and improves responsiveness to stakeholder needs.
- **Assurance:** This dimension relates to the knowledge and courtesy of employees and their ability to convey trust and confidence. It is directly influenced by human capital through comprehensive training programs and capacity building, which enhance the professionalism and credibility of customs officers.
- **Tangibles:** These are the physical facilities, equipment, and appearance of personnel. Structural capital, particularly investments in digital infrastructure and automation technologies, plays a central role in modernizing customs systems, enhancing transparency, and ensuring a more efficient and reliable service environment.
- **Empathy:** Referring to the provision of caring and individualized attention to customers, this dimension is primarily supported by relational capital. Strong relationships with traders, brokers, and international partners help customs departments better understand and address the specific needs of stakeholders, thereby improving satisfaction and trust.

By aligning the elements of intellectual capital with the SERVQUAL dimensions, this integrative approach provides a comprehensive understanding of how intangible resources can be strategically leveraged to improve customs service quality.

Mediating and Moderating Factors in the Relationship between Intellectual Capital and the Quality of Customs Services

In addition to the direct relationship between intellectual capital and the quality of customs services, the literature highlights the presence of several mediating and moderating factors that may influence the strength or direction of this relationship. These factors contribute to a more nuanced understanding of how intellectual capital operates within institutional contexts to affect service outcomes.

- **Internal Audit as a Mediating Factor:** Internal audit plays a pivotal role in evaluating the effectiveness of intellectual capital deployment within customs institutions. By ensuring that human, structural, and relational resources are utilized efficiently and in alignment with organizational goals, internal audit acts as a control mechanism that enhances service quality. It provides continuous feedback loops, identifies gaps in service provision, and supports corrective actions, thereby mediating the relationship between intellectual capital and service quality (Korutaro Nkundabanyanga et al., 2014).
- **Regulatory Framework as a Moderating Factor:** The institutional and legal environment in which customs agencies operate significantly influences the ability to leverage intellectual capital. A robust regulatory framework can either facilitate or constrain the optimal use of intellectual capital by defining the scope of discretion, autonomy, and innovation available to customs managers. Regulatory rigidity may limit the translation of intellectual capital into improved service quality, whereas supportive and adaptive regulations can enhance its impact (Juma & Payne, 2004).

By considering these mediating and moderating variables, researchers and policymakers can better understand the mechanisms through which intellectual capital influences service quality in the customs sector, and can design interventions that strengthen these relationships.

Conceptual Model of the Causal Relationship between Intellectual Capital and the Quality of Customs Services

Building upon the theoretical foundations and the research gaps identified in the literature review, this study proposes a conceptual model to elucidate the causal relationship between intellectual capital and the quality of customs services. The model is grounded in the SERVQUAL framework (Parasuraman et al., 1988) and integrates relevant mediating and moderating variables to offer a holistic understanding of the dynamics influencing service delivery within customs administrations, particularly across the MENA region.

Core Constructs of the Model

- **Independent Variable: Intellectual Capital:** Intellectual capital is conceptualized as a multidimensional construct comprising three interrelated components:
 - *Human Capital:* Refers to the knowledge, skills, competencies, and professional experience possessed by customs employees.
 - *Structural Capital:* Encompasses organizational infrastructure, internal systems, databases, policies, and technologies that support customs operations.
 - *Relational Capital:* Pertains to the relationships and networks developed with external stakeholders, including clients, trade partners, governmental bodies, and international organizations.
- **Dependent Variable: Quality of Customs Services:** This construct is operationalized using the five dimensions of the SERVQUAL model:
 - *Reliability:* The ability to deliver services accurately and consistently.
 - *Responsiveness:* The capacity to provide prompt and effective service.
 - *Assurance:* The extent to which employees instill confidence and trust in service recipients.
 - *Tangibles:* The physical facilities, equipment, and appearance of service personnel.
 - *Empathy:* The degree of individualized attention and care provided to stakeholders.

Mediating Variable

- **Internal Audit:** The internal audit function is posited as a mediating variable that facilitates the transformation of intellectual capital into improved service outcomes. Acting as an internal control mechanism, it ensures the optimal deployment of intellectual capital through evaluation, risk assessment, and continuous feedback. This alignment enhances accountability and institutional learning, contributing to higher service quality (Korutaro Nkundabanyanga et al., 2014).

Moderating Variable

- **Regulatory Framework:** The regulatory framework is hypothesized to moderate the relationship between intellectual capital and customs service quality. National and regional regulations can either enhance or constrain the application of intellectual capital by affecting innovation, resource allocation, and policy implementation. A supportive regulatory environment may strengthen this relationship, whereas restrictive frameworks may dilute or obstruct its impact (Juma & Payne, 2004).

Hypothetical Relationship in the Model

Based on the preceding constructs, the following hypothetical relationships are proposed:

- **Direct Effect:**
H1: Intellectual Capital → Quality of Customs Services
Intellectual capital is expected to positively influence the quality of customs services across all SERVQUAL dimensions.
- **Mediated Effect:**
H2: Intellectual Capital → Internal Audit → Quality of Customs Services
Internal audit mediates the relationship between intellectual capital and service quality by ensuring the efficient use and monitoring of intangible assets.
- **Moderated Effect:**
H3: Regulatory Framework moderates the relationship between Intellectual Capital and Quality of Customs Services

The strength and direction of the impact of intellectual capital on service quality depend on the nature of the regulatory environment.

Proposed Framework

Based on the above, the proposed analytical framework can be represented as follows in Figure 2:

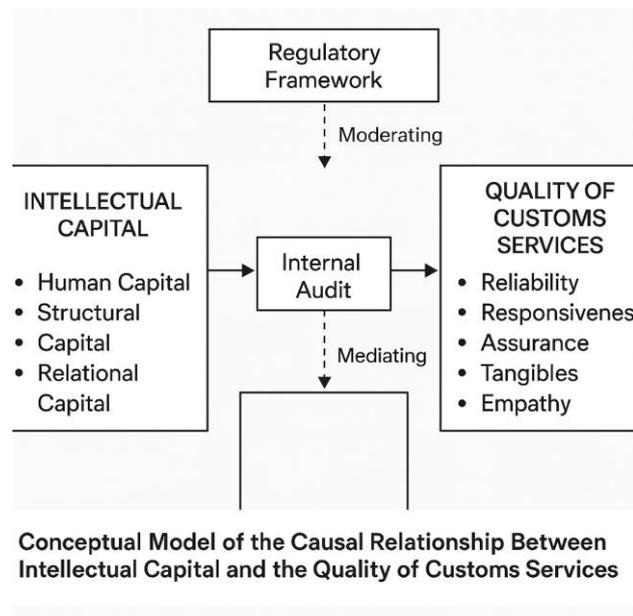


Figure 2: Proposed Framework

Source: Authors

This analytical framework represents a comprehensive model for understanding the mechanisms through which intellectual capital contributes to enhancing the quality of customs services. It delineates the causal pathways between the three primary components of intellectual capital; human, structural, and relational capital, and the key dimensions of service quality as articulated by the SERVQUAL model: reliability, responsiveness, assurance, tangibles, and empathy. Moreover, the framework incorporates internal audit as a mediating factor that ensures the effective utilization of intellectual capital and reinforces service quality, while also recognizing the regulatory framework as a moderating variable that shapes the environment in which intellectual capital is deployed.

Accordingly, this conceptual model provides a robust foundation for empirical investigations that aim to examine the interrelationships between intellectual capital and service quality in the customs sector. It addresses an evident gap in the literature by adapting established theoretical constructs to the specific institutional and operational context of customs administrations particularly within the MENA region. As such, this framework not only contributes to the theoretical enrichment of the field but also offers practical implications for policy development and strategic planning aimed at optimizing customs performance.

Conclusion and Recommendations

This study affirms that intellectual capital constitutes a critical determinant in enhancing the quality of customs services. The components of intellectual capital; namely human, structural, and relational capital play an integral role in optimizing the efficiency of customs operations and elevating customer satisfaction. The systematic review of prior literature demonstrates that investments in human capital, particularly through continuous training and capacity-building initiatives, lead to the development of technical and procedural competencies that enhance the speed and accuracy of customs processing. Similarly, structural capital manifested through the adoption of advanced digital systems and smart technologies contributes to reducing operational errors and streamlining procedures. In parallel, relational

capital strengthens partnerships with external stakeholders, such as the private sector and government entities, thereby facilitating customs clearance and minimizing bureaucratic impediments.

Despite the recognized benefits of intellectual capital, the study identifies a clear gap in the literature concerning its empirical application within the customs sector, particularly in the context of the Middle East and North Africa (MENA) region. Furthermore, the analysis reveals the presence of mediating and moderating variables, such as internal audit and regulatory frameworks, that significantly influence the relationship between intellectual capital and service quality. Accordingly, this study proposes an analytical framework grounded in the SERVQUAL model, delineating the pathways through which intellectual capital dimensions affect the five core service quality dimensions: reliability, responsiveness, assurance, tangibles, and empathy. This model serves as a basis for future empirical research utilizing structural equation modeling (SEM) to validate the proposed relationships in varied institutional settings.

Based on the study's findings, the following strategic recommendations are proposed:

- **Enhancing Human Capital:** Customs administrations should prioritize investments in human capital through comprehensive, continuous training programs that enhance employees' technical knowledge, digital literacy, and problem-solving capabilities. Recruitment strategies should also aim to attract highly skilled professionals with specialized knowledge in customs operations and international trade compliance.
- **Developing Structural Capital:** The adoption of digital transformation strategies is essential to strengthen structural capital. This includes the implementation of integrated customs management systems, automated risk assessment tools, and knowledge management platforms that support institutional learning and operational consistency.
- **Strengthening Relational Capital:** Building strong networks with external stakeholders including traders, logistics providers, and government agencies is critical. Enhancing customer relationship management systems and communication channels will contribute to increased transparency, reduced processing time, and higher levels of stakeholder satisfaction.
- **Activating Internal Audit Mechanisms:** Internal auditing should be institutionalized as a core management function to monitor the deployment of intellectual capital and ensure compliance with service quality standards. Key performance indicators (KPIs) should be systematically employed to assess progress, inform decision-making, and align operational practices with strategic objectives.
- **Improving the Regulatory Framework:** A flexible and forward-looking regulatory environment is imperative for maximizing the returns on intellectual capital. Policymakers should undertake reforms that align customs laws and procedures with international best practices, promoting agility, efficiency, and legal certainty in customs operations.
- **Future Research Directions:** The study recommends the implementation of experimental and comparative research designs to empirically validate the proposed analytical framework. Future studies should employ advanced statistical techniques, such as SEM to assess the strength and direction of relationships among variables across different customs administrations and regulatory environments.

In conclusion, intellectual capital emerges as a foundational pillar for advancing the quality of customs services. The proposed framework underscores the importance of an integrated approach that combines investments in human, structural, and relational capital, complemented by robust internal audit functions and adaptive regulatory systems. The successful implementation of these components is anticipated to enhance institutional performance, elevate service delivery standards, and position customs administrations as key enablers of efficient and competitive global trade.

References

- Abd-Elrahman, A. E. H., & Ahmed Kamal, J. M. (2022). Relational capital, service quality and organizational performance in the Egyptian telecommunication sector. *International Journal of Emerging Markets*, 17(1), 299-324.
- Abd-Elrahman, A. E. H., El-Borsaly, A. A. E., Hafez, E. A. E., & Hassan, S. A. (2020). Intellectual capital and service quality within the mobile telecommunications sector of Egypt. *Journal of Intellectual Capital*, 21(6), 1185-1208.
- Abdolvand, M. A., & Taghipouryan, M. J. (2011). Evaluation of customs service quality by using fuzzy SERVQUAL and fuzzy MCDM. *American Journal of Scientific Research*, 35, 89-103.
- Adnan, N. S., Kamaluddi, A., & Kasim, N. (2013). Intellectual capital in religious organisations: Malaysian zakat institutions perspective. *Middle-East Journal of Scientific Research*, 16(3), 368-377.
- Akil, S. R., Soemaryani, I., Hilmiana, H., & Joeliaty, J. (2021). Determinant factors of intellectual capital for improving public sector innovation: an empirical study from Indonesia. *The Journal of Asian Finance, Economics and Business*, 8(12), 421-429.
- Al Oraini, B., Mohammad, A. A. S., Al-Fakeh, F. A. A., Almomani, H. M., Vasudevan, A., Alshurideh, M. T., Mohammad, S. I., Barhoom, F. N. I., & Smadi, S. (2024). The Future of Online Retail to Omnichannel Commerce in E-commerce Evolution. In *Frontiers of Human Centricity in the Artificial Intelligence-Driven Society 5.0* (pp. 377-392). Cham: Springer Nature Switzerland.
- Alshawabkeh, R. E. K. E. L. (2018). The impact of intellectual capital development on provided health services quality. *International Journal of Advanced Educational Research*, 3(2), 481-486.
- Anggraini, F., Abdul-Hamid, M. A., & Azlina, M. K. A. (2018). The Role of Intellectual Capital on Public Universities Performance in Indonesia. *Pertanika Journal of Social Sciences & Humanities*, 26(4), 2453-2472.
- Aryee, S., Walumbwa, F. O., Seidu, E. Y., & Otake, L. E. (2016). Developing and leveraging human capital resource to promote service quality: Testing a theory of performance. *Journal of management*, 42(2), 480-499.
- Asutay, M., & Ubaidillah. (2024). Examining the impact of intellectual capital performance on financial performance in islamic banks. *Journal of the Knowledge Economy*, 15(1), 1231-1263.
- Awan, A. G., & Saeed, K. (2015). Relationship between intellectual capital and organizational performance: a case study of public sector universities in Southern Punjab-Pakistan. *Journal of Resources Development and Management*, 9(2), 35-46.
- Ayarza, J. A. C. (2022). Import and export process: the impact of bureaucratic simplification in customs clearance. *Independent Journal of Management & Production*, 13(2), 548-569.
- Barhoom, F. N. I., Wah, K. K., Abueid, A. I., Abusalma, A., Masadeh, M., Al sarayreh, A., Mohammad, S. I., Vasudevan, A., & Mohammad, A. A. S. (2025a). Continuous

- Improvement: Exploring the Relationship Between Six Sigma Implementation and Organizational Agility in the Jordan Customs Department. In *Artificial Intelligence, Sustainable Technologies, and Business Innovation: Opportunities and Challenges of Digital Transformation* (pp. 817-830). Cham: Springer Nature Switzerland.
- Barhoom, F. N., Alsakarneh, G. K. S., & Almetrami, R. A. (2025b). Green Servitization and Sustainability in Manufacturing: The Mediating Role of Circular Economy Practices and the Moderating Effect of Environmental, Social, and Governance Compliance in Jordan. *Sustainable Trends and Business Research*, 3(1), 49-61.
- Barhoom, F. N., Wah, K. K., & Alnoor, A. (2025c). A Systematic Literature Review on Using Six Sigma Methodology to Improve Customs Service Quality: Evidence from MENA Region. *International Journal of Academic Reserach in Economics and Management Sciences*, 14(1), 323-348.
- Behaylu, R. H., & Gizaw, G. A. (2020). Intellectual Capital and Its Effect on Service Quality of Commercial Bank of Ethiopia: Evidence from SNNPR District. *Research Journal of Finance and Accounting*, 11(3), 28-33.
- Braendle, U., Farah, A., & Balian, P. (2017). CORPORATE GOVERNANCE, INTELLECTUAL CAPITAL AND PERFORMANCE: EVIDENCE FROM THE PUBLIC SECTOR IN THE GCC. *Risk Governance & Control: Financial Markets & Institutions*, 7(4), 23-29.
- Budiarso, N. S. (2019). Intellectual capital in public sector. *Accountability*, 8(1), 42-50.
- Busenan, E. F. M., Ramli, A., & Bakar, M. S. (2018). Intellectual capital and its importance to the public sector. *Journal of Global Business and Social Entrepreneurship (GBSE)*, 4(10), 131-138.
- Cricelli, L., Greco, M., Grimaldi, M., & Llanes Dueñas, L. P. (2018). Intellectual capital and university performance in emerging countries: Evidence from Colombian public universities. *Journal of intellectual capital*, 19(1), 71-95.
- Datta, B. (2014). Performance of intellectual capital management of Indian public sector enterprises. *International Journal of Applied Operational Research*, 4(1), 27-38.
- Dionysopoulou, P., Svarnias, G., & Papailias, T. (2021). Total Quality Management in Public Sector, Case Study: Customs Service. *Regional Science Inquiry*, 13(1), 153-168.
- Erceg, A. (2013). The new computerized transit system and e-customs influence on savings in transit time and costs. *Business Logistics in Modern Management*, 13, 143-152.
- Ghaleb, E. A., Dominic, P. D., Alzoraiki, M., Mohamed, I., Naji, G. M. A., & Ammar, A. A. (2022). The role of transformational leadership style and intellectual capital in improving the service quality of the public healthcare sector in developing countries—conceptual study. *International Journal of Intellectual Human Resource Management (IJHRM)*, 3(01), 01-07.
- Guthrie, J., & Dumay, J. (2015). New frontiers in the use of intellectual capital in the public sector. *Journal of Intellectual Capital*, 16(2), 258-266.
- Hidayah, N., Hapsari, D. W., Saputra, K. A. K., Dharmawan, N. A. S., & Yadiati, W. (2023). Can Institutional Good Governance and Intellectual Capital Affect University Quality?. *International Journal of Economics & Management*, 17(2), 251-261.
- Huian, M. C., Bisogno, M., & Mironiuc, M. (2024). Managing Intellectual Capital Components in Technology Transfer Processes: The Case of Romanian Public Research Institutes. *Journal of the Knowledge Economy*, 1-34.
- Indiyati, D. (2018). The role of organisational culture, intellectual capital and competitive advantage in supporting the government policies in education. *International Journal of Economic Policy in Emerging Economies*, 11(1-2), 68-82.

- Juma, N., & Payne, G. T. (2004). Intellectual capital and performance of new venture high-tech firms. *International Journal of Innovation Management*, 8(03), 297-318.
- Kamaruddin, K., & Abeysekera, I. (2021). Intellectual capital and sustainable economic performance in the public sector: the context of the new public management in Malaysia. *Sustainability*, 13(14), 7885.
- Kamukama, N. (2013). Intellectual capital: Firms' hidden source of service quality in the microfinance industry in Uganda. *Journal of African Business*, 14(3), 150-161.
- Khan, A. A., & Nouman, M. (2019). Intellectual Capital in Practice in the Public Sector: Developing a Conceptual Framework for the 'Third Wave'. *Business & Economic Review*, 11(2), 1-18.
- Khoshnaw, D., & Karadaş, G. (2024). Transactional leadership and intellectual capital, the mediating role of knowledge sharing: The study of customs employees in Sulaymaniyah governorate. *Heliyon*, 10(19), e38747.
- Korutaro Nkundabanyanga, S., M. Ntayi, J., Ahiauzu, A., & K. Sejjaaka, S. (2014). Intellectual capital in Ugandan service firms as mediator of board governance and firm performance. *African journal of economic and management studies*, 5(3), 300-340.
- Lawrence, S. A., & Mupa, M. N. (2024). Innovative approaches to enhancing logistics for adapting to the evolving demands of manufacturing companies in East Africa through improved lean strategies. *World Journal of Advanced Research and Reviews*, 23, 2179-2198.
- Maayah, E. I., Abu Aqoula, B. M. A., & Barhoom, F. N. (2025). The Role of IPSAS in Enhancing Transparency and Accountability in the Public Sector of Jordan: A Literature Review. *International Journal of Academic Research in Accounting, Finance & Management Sciences*, 15(1), 413-424.
- Manes Rossi, F., Citro, F., & Bisogno, M. (2016). Intellectual capital in action: evidence from Italian local governments. *Journal of Intellectual Capital*, 17(4), 696-713.
- Maria Morariu, C. (2014). Intellectual capital performance in the case of Romanian public companies. *Journal of Intellectual capital*, 15(3), 392-410.
- Nguyen, N. T. (2023). The impact of intellectual capital on service firm financial performance in emerging countries: The case of Vietnam. *Sustainability*, 15(9), 7332.
- Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., ... Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ*, 372, n71.
- Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988). Servqual: A multiple-item scale for measuring consumer perc. *Journal of retailing*, 64(1), 12.
- Parthiban, M. M., Murali, T. S., & Subramanian, G. K. (2020). World Customs Organization and global trade: imprints and future paradigms. *World Customs Journal*, 14(2), 157-176.
- Petruk, O., Vyhovska, N., & Kostyshyn, Y. (2022). Development of customs control in the system of ensuring the financial security of a country. *Accounting and Financial Control*, 4(1), 30-40.
- Riana, I. G., Wayan Suana, I., & Mandala, K. (2018). Intellectual Capital as A Basis of Service Performance on Village Credit Institution. *Journal of Multidisciplinary Academic*, 2(1), 7-12.

- Santos-Rodrigues, H. (2013). Intellectual capital and innovation: A case study of a public healthcare organisation in Europe. *Electronic Journal of Knowledge Management*, 11(4), 361-372.
- Strazzullo, S., Cricelli, L., & Grimaldi, M. (2024). Intellectual capital and R&D performance improvement: the case of Italian public universities. *R&D Management*, 54(4), 852-863.
- Weqar, F., & Haque, S. I. (2020). Intellectual capital and corporate financial performance in India's central public sector enterprises. *International Journal of Learning and Intellectual Capital*, 17(1), 77-97.
- Whittemore, R., & Knaf, K. (2005). The integrative review: Updated methodology. *Journal of Advanced Nursing*, 52(5), 546–553.
- Wudhikarn, R., Chakpitak, N., & Neubert, G. (2020). Improving the strategic benchmarking of intellectual capital management in logistics service providers. *Sustainability*, 12(23), 10174.