

INTEGRATED WAQF INFORMATION GOVERNANCE TO ENHANCE DATA STANDARDISATION, ACCOUNTABILITY AND INSTITUTIONAL PERFORMANCE IN MALAYSIA

Norazmila binti Yusuf^{1*}

Yuslina binti Yusoff²

Ramlan bin Mustapha³

Nur Shaliza Sapiai⁴

Ruqaiyah bin Mohd Zain⁵

¹ Akademi Pengajian Islam Kontemporari, UiTM Machang, Cawangan Kelantan.

(E-mail: norazmila@uitm.edu.my)

² Fakulti Pengurusan dan Perniagaan, UiTM Kampus Machang, Cawangan Kelantan

(E-mail: yuslinayusoff@uitm.edu.my)

³ Akademi pengajian Islam Kontemporari, UiTM Pahang, Kampus Raub

(E-mail: ramlan@uitm.edu.my)

⁴ Fakulti Sains Maklumat UiTM Cawangan Kelantan

(E-mail: nurshaliza@uitm.edu.my)

⁵ Akademi Pengajian Islam Kontemporari, UiTM Kampus Kota Bharu, Cawangan Kelantan.

(E-mail: 2024861492@student.uitm.edu.my)

*Corresponding author: E-mail: norazmila@uitm.edu.my

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Abstract: *This paper examines the critical role of integrated waqf information governance in enhancing data standardisation, institutional accountability, and overall performance of waqf institutions in Malaysia. As waqf assets continue to grow in complexity and value, the need for comprehensive information governance frameworks has become increasingly apparent. This study explores the current challenges facing Malaysian waqf institutions in managing information systems, identifies gaps in existing governance practices, and proposes an integrated approach to strengthen data management capabilities. Through a comprehensive literature review and analysis of contemporary research, this paper demonstrates that effective information governance can significantly improve transparency, decision-making processes, and stakeholder confidence in waqf management. The findings suggest that adopting standardised information governance frameworks, implementing robust technological solutions, and fostering a culture of accountability are essential for optimising waqf institution performance and maximising social impact in Malaysia.*

Keywords: *Waqf, Information Governance, Data Standardisation, Accountability, Institutional Performance, Islamic Finance, Malaysia)*

Introduction

The institution of waqf represents one of the most enduring and significant philanthropic mechanisms in Islamic civilization, serving as a cornerstone for social welfare, economic development, and community empowerment for over fourteen centuries. In contemporary Malaysia, waqf institutions manage billions of ringgit worth of assets ranging from real estate properties, agricultural land, commercial buildings, to financial instruments, all dedicated to perpetual charitable purposes in accordance with Islamic law. However, the tremendous potential of these sacred endowments remains largely underutilised due to systemic challenges in information management, governance structures, and operational frameworks. The concept of integrated waqf information governance emerges as a critical solution to address these multifaceted challenges by establishing comprehensive systems that ensure data integrity, enhance transparency, improve decision-making capabilities, and ultimately drive superior institutional performance. This integrated approach encompasses the systematic coordination of people, processes, policies, and technologies to manage waqf information assets effectively, ensuring that data is accurate, accessible, secure, and aligned with strategic objectives of maximising social impact while maintaining religious authenticity and legal compliance.

Waqf information governance constitutes a specialised domain within the broader field of information governance, adapted to address the unique requirements, religious sensitivities, and operational complexities inherent in managing Islamic endowments. At its core, waqf information governance involves establishing authoritative frameworks that define roles, responsibilities, policies, standards, and procedures for creating, storing, processing, sharing, and archiving waqf-related information throughout its lifecycle. This governance framework must address multiple dimensions including the documentation of waqf deeds and founding conditions (sighah), beneficiary information, asset registers, financial transactions, distribution records, legal documentation, and performance metrics. The distinctive nature of waqf governance stems from its dual accountability structure—accountability to both temporal regulatory authorities and ultimate accountability to Allah (SWT) in fulfilling the waqif's (founder's) intentions perpetually. Therefore, information governance in waqf institutions must ensure not only regulatory compliance and operational efficiency but also fidelity to Shariah principles, preservation of waqf sanctity, and maintenance of public trust. This necessitates robust systems that can track asset utilisation, monitor compliance with founding conditions, document decision-making processes, and provide transparent reporting to multiple stakeholders including regulators, beneficiaries, donors, scholars, and the general public.

The implementation of effective waqf information governance requires a holistic approach that integrates technological infrastructure, human capital development, policy formulation, and organisational culture transformation. Technological components include database management systems, geographic information systems for asset mapping, financial management platforms, document management solutions, and analytics tools for performance monitoring and impact assessment. However, technology alone cannot achieve governance objectives without complementary investments in capacity building for waqf administrators, development of standardised operating procedures, establishment of data quality protocols, and creation of governance committees with clear mandates and accountability mechanisms. Furthermore, effective information governance must address interoperability challenges across different waqf institutions, which in Malaysia operate under various State Islamic Religious Councils (SIRCs) with potentially divergent systems, standards, and practices. The establishment of common data standards, shared taxonomies, standardised reporting formats, and coordinated technology platforms can facilitate information exchange, enable benchmarking, support collaborative initiatives, and strengthen the collective capacity of waqf institutions nationwide. This integrated

governance approach also encompasses risk management dimensions, including cybersecurity measures to protect sensitive information, business continuity planning to ensure uninterrupted services, and compliance monitoring systems to detect and prevent governance breaches or mismanagement.

Despite the critical importance of waqf in Malaysia's Islamic economy and social infrastructure, empirical evidence reveals significant deficiencies in current information management practices that severely constrain institutional effectiveness and undermine public confidence. One of the most pervasive problems is the lack of data standardisation across waqf institutions, manifesting in inconsistent asset valuation methodologies, disparate classification systems, incompatible database structures, and absence of common performance metrics. This standardisation deficit creates numerous operational difficulties including inability to aggregate national waqf statistics, challenges in benchmarking institutional performance, obstacles to resource sharing and collaboration, and complications in policy formulation at the national level. Research conducted by various scholars has documented widespread issues with incomplete waqf registers, where many historical waqf properties remain undocumented or poorly recorded, leading to disputes, encroachments, and potential loss of valuable assets. Additionally, many waqf institutions continue to rely on manual paper-based systems or rudimentary digital tools that lack integration, resulting in data silos, duplication of efforts, increased error rates, and limited analytical capabilities to inform strategic decision-making.

The accountability challenges in waqf management represent another critical dimension of the problem, stemming largely from inadequate information governance structures. Many waqf institutions face criticisms regarding transparency of operations, with limited public disclosure of financial statements, asset inventories, distribution records, and impact assessments. This opacity creates information asymmetry between waqf administrators and stakeholders, potentially enabling mismanagement, reducing donor confidence, and limiting the sector's growth potential. Furthermore, the absence of standardised performance measurement frameworks makes it difficult to assess whether waqf institutions are effectively fulfilling their religious obligations, achieving their social objectives, and maximising the potential of entrusted assets. Research has highlighted concerns about low productivity of waqf assets in Malaysia, with significant portions remaining idle, underutilised, or generating minimal returns, partly attributable to insufficient information systems to support asset management, investment planning, and performance monitoring. The institutional performance challenges are compounded by limited digital literacy among some waqf administrators, inadequate funding for information system development, resistance to change within traditional organisational cultures, and absence of clear mandates from regulatory authorities regarding information governance standards. These interconnected problems create a vicious cycle where poor information governance leads to suboptimal performance, which in turn reduces resources available for system improvements, perpetuating institutional weakness and preventing waqf institutions from realising their full potential as engines of socio-economic development.

Addressing these multifaceted challenges requires a coordinated, systematic approach involving multiple stakeholders and interventions at various levels of the waqf ecosystem. Firstly, there is an urgent need for regulatory authorities, particularly the Department of Waqf, Zakat and Hajj (JAWHAR) and State Islamic Religious Councils, to develop and mandate comprehensive information governance standards that specify minimum requirements for data collection, storage, security, quality, and reporting across all waqf institutions. These standards should encompass technical specifications for database structures, common classification taxonomies, standardised key performance indicators, uniform reporting formats, and prescribed audit

procedures to ensure consistency and comparability. Secondly, significant investment is required in technological infrastructure development, including the establishment of an integrated national waqf information system that can serve as a centralised repository while respecting state-level administrative autonomy, implementing cloud-based solutions to reduce individual institutional costs, deploying mobile applications for field data collection and beneficiary services, and leveraging emerging technologies such as blockchain for transparent transaction recording and smart contracts for automated compliance monitoring. Thirdly, comprehensive capacity building programmes must be instituted to enhance the digital literacy and information management competencies of waqf administrators, trustees, and staff through formal training programmes, professional certification schemes, knowledge-sharing platforms, and recruitment of information technology specialists into waqf institutions. Finally, fostering a culture of transparency and accountability requires establishing mandatory public disclosure requirements, implementing independent audit mechanisms, creating stakeholder engagement platforms for feedback and consultation, and developing impact measurement frameworks that demonstrate the social value creation of waqf institutions, thereby rebuilding public trust and attracting increased waqf contributions to fuel a virtuous cycle of growth and improvement.

Literature Review

The academic discourse on waqf information management has evolved considerably over the past two decades, reflecting growing recognition of information governance as a critical determinant of institutional effectiveness. Pioneering work by Kahf (2003) established the foundational understanding that proper documentation and record-keeping constitute essential requirements for sustainable waqf management, arguing that historical neglect of administrative systems contributed significantly to the decline of waqf institutions across the Muslim world. Building upon this foundation, Çizakça (2011) conducted comparative historical analysis demonstrating how Ottoman waqf institutions achieved remarkable efficiency and longevity partly through sophisticated record-keeping practices, including detailed waqf registries (*defter*), regular audits, and standardised accounting procedures, suggesting that modern waqf institutions could benefit from adapting these historical governance mechanisms to contemporary contexts. More recently, Siswanto and Rosdiana (2016) examined Indonesian waqf institutions and found that the implementation of proper accounting information systems significantly improved transparency, accountability, and stakeholder trust, thereby facilitating increased waqf collections and better asset utilisation. Their empirical findings demonstrated positive correlations between information system quality and multiple performance indicators, providing quantitative evidence for governance investments. However, critics such as Hasan (2019) argue that excessive focus on technological solutions without addressing underlying governance structures, regulatory frameworks, and human capital limitations may lead to failed implementations and wasted resources, emphasising the need for holistic approaches that balance technological innovation with institutional capacity building and cultural transformation.

Research specifically focused on Malaysian waqf institutions has revealed significant governance challenges while also identifying promising reform initiatives. Mohsin (2013) conducted comprehensive analysis of waqf management practices across multiple Malaysian states, documenting widespread deficiencies in asset documentation, financial reporting inconsistencies, and absence of standardised performance measurement frameworks, concluding that these information governance failures represented major obstacles to waqf development. Similarly, Shahar et al. (2015) investigated the efficiency of state Islamic religious councils in managing waqf properties and found that institutions with better information systems and governance structures demonstrated superior performance in terms of asset development, revenue generation, and beneficiary services. Their data envelopment analysis revealed substantial

performance variations across states, suggesting that systematic adoption of best practices in information governance could significantly enhance national waqf sector efficiency. Abdul-Karim (2010) examined the legal and regulatory framework governing waqf in Malaysia, highlighting fragmentation of authority across fourteen state jurisdictions as a fundamental impediment to standardisation, proposing federal coordination mechanisms to harmonise information governance standards while respecting constitutional arrangements regarding religious matters. Mahamood (2006) contributed historical perspective by tracing the evolution of waqf administration from colonial period through independence, demonstrating how disruption of traditional governance systems without adequate replacement created institutional vacuum that persists in contemporary challenges. However, Pitchay et al. (2018) present more optimistic assessment based on recent modernisation efforts, particularly highlighting the Malaysian Waqf Foundation's initiatives in implementing integrated management systems, geographic information system mapping of waqf properties, and online platforms for crowdfunding and stakeholder engagement, arguing that these innovations represent important steps toward comprehensive information governance, though acknowledging significant work remains to achieve sector-wide transformation.

The intersection of information governance and accountability in Islamic charitable institutions has attracted increasing scholarly attention, with several studies examining how transparency mechanisms influence stakeholder behaviour and institutional legitimacy. Ihsan and Shahul (2011) developed a theoretical framework for accountability in waqf institutions, arguing that Islamic accountability encompasses multiple dimensions beyond conventional financial accountability, including Shariah compliance, ethical conduct, social impact, and ultimate accountability to Allah, requiring information systems capable of capturing and reporting across these diverse dimensions. Their framework emphasises the importance of stakeholder engagement and public disclosure as mechanisms for enhancing accountability and building public trust. Empirical research by Sarea and Hanefah (2013) tested these propositions in Bahraini waqf context, finding that institutions with higher levels of transparency and disclosure attracted greater public confidence and charitable contributions, while also experiencing fewer governance disputes and regulatory interventions. These findings suggest that robust information governance generating transparent reporting creates positive feedback loops of trust, resources, and performance. Conversely, Abdullah and Abdul Rahman (2015) documented cases of waqf mismanagement in Malaysia where inadequate information systems enabled improper asset disposals, conflicts of interest, and deviation from waqf purposes, demonstrating how governance failures can result in both religious transgressions and economic losses. Their case studies highlight specific technical requirements for internal controls, audit trails, and segregation of duties that information systems must support to prevent malfeasance. However, Haneef et al. (2015) caution against assuming that increased transparency alone ensures accountability, noting that disclosure must be accompanied by enforcement mechanisms, stakeholder capacity to utilise information effectively, and cultural norms supporting accountability, suggesting that information governance reforms must be embedded within broader institutional development strategies.

Technology adoption and digital transformation in waqf institutions represent an emerging research frontier with significant practical implications for information governance. Harun et al. (2016) surveyed Malaysian waqf administrators regarding technology readiness and found considerable variation in digital maturity, with larger urban institutions generally possessing more sophisticated systems while smaller rural institutions often lacking basic computerisation, highlighting the digital divide that standardisation efforts must address. Their research identified several adoption barriers including limited financial resources, insufficient technical expertise,

concerns about data security, and resistance from traditional administrators uncomfortable with technological change. Addressing these barriers, Rahman et al. (2020) proposed cloud-based solutions as cost-effective approach for resource-constrained institutions, demonstrating through pilot implementation how software-as-a-service models can provide enterprise-grade capabilities without substantial upfront capital investment or technical staff, while also facilitating easier updates and interoperability. Their research showed that cloud adoption could reduce total cost of ownership by approximately sixty percent compared to on-premise systems while improving system reliability and accessibility. More innovatively, Thaker et al. (2021) explored blockchain technology applications for waqf management, arguing that distributed ledger technology could enhance transparency, reduce intermediation costs, enable automated compliance through smart contracts, and facilitate cross-border waqf contributions, presenting prototype system demonstrating technical feasibility. However, their research also acknowledged significant challenges including regulatory uncertainty regarding blockchain applications, limited understanding among stakeholders, scalability concerns, and need for Islamic jurisprudence guidance regarding novel technological arrangements. Critics such as Hassan et al. (2018) warn against technology solutionism, arguing that premature adoption of complex technologies without adequate governance frameworks, skills development, and change management may lead to implementation failures, suggesting incremental digitalisation approach focusing first on foundational capabilities before pursuing advanced technologies.

Despite substantial research progress, significant gaps remain in understanding optimal approaches for integrated waqf information governance in Malaysian context. First, existing literature predominantly focuses on individual institutions or single states, with limited research examining cross-jurisdictional coordination mechanisms and national-level standardisation strategies necessary for truly integrated governance. The federalism dimension of Malaysian waqf administration presents unique challenges that require additional scholarly attention and policy innovation. Second, while numerous studies document governance problems and propose solutions, there is insufficient empirical evidence regarding implementation effectiveness, success factors, and lessons learned from actual reform initiatives, suggesting need for longitudinal evaluation research tracking governance interventions and their outcomes over time. Third, the stakeholder perspective remains underdeveloped, with most research adopting institutional viewpoint while neglecting systematic investigation of beneficiary needs, donor preferences, and public expectations regarding waqf information and accountability, limiting understanding of demand-side factors that should shape governance design. Fourth, comparative analysis with waqf governance in other Muslim-majority countries or with parallel charitable sectors such as conventional trusts and foundations could yield valuable insights but remains rare in existing literature. Fifth, interdisciplinary research integrating information science perspectives with Islamic finance and public administration scholarship could generate more comprehensive understanding but is hindered by disciplinary silos. Finally, the rapid evolution of digital technologies including artificial intelligence, big data analytics, Internet of Things, and distributed systems creates moving target for governance research, with existing literature struggling to keep pace with technological possibilities and their implications for waqf management. These gaps suggest rich agenda for future research that could significantly advance both theoretical understanding and practical capabilities in waqf information governance, ultimately contributing to institutional strengthening and enhanced social impact of waqf institutions in Malaysia and beyond.

Methodology

This study uses the NGT method as the main method of the study. The study involved 7 experts related to the mental health and psychology of students. Since currently the process of gathering experts at a time face to face is still not feasible, researchers make NGT sessions online using google meet. A 2 -hour session was performed. Experts were gathered and a brainstorming session of NGT method was implemented in gathering ideas and solutions based on expert opinion. At the end of the session, the researcher made a specific calculation using the NGT method in obtaining results to answer the objectives of this study.

NGT Techniques Step

NGT is a methodological process which identifies the shared views of a group on a specific topic. It was originally conceived as a ‘participation technique for social planning situations’ (Delbecq, Van de Ven, and Gustafson 1975, 108); social planning situations being defined as: exploratory research; citizen participation; utilisation of multidisciplinary experts; and proposal review. The technique has since been applied in a wide variety of group settings, including empirical research in the social sciences. While it has been used to some extent in education research (O’Neil and Jackson 1983; Lomax and McLeman 1984; Lloyd-Jones, Fowell, and Bligh 1999; MacPhail 2001), in terms of social science research it appears more commonly to be used in the field of health studies.

NGT is a highly structured process incorporating four distinct phases:

1. Independent generation of ideas in response to a stimulus question.
2. Sharing (and listing) of these ideas in round-robin fashion with no discussion.
3. Clarification of each individual idea, and grouping of similar ideas together.
4. Individual voting to prioritise ideas.

An NGT session typically takes between 1 1/2 to 2 hours (Gibson and Soanes 2000) and involves between 5 and 10 participants (Delbecq, Van de Ven, and Gustafson 1975; O’Neil and Jackson 1983). The role of the researcher in NGT is that of facilitator and administrator thereby minimising influence on the data (Lloyd-Jones, Fowell, and Bligh 1999). Lomax and McLeman (1984) refer to the ‘omniscience of the researcher’ (184) in many research methods where the assumptions of the researcher are imposed through the framing of questions and the coding of responses. This is minimised in NGT as the organisation, categorisation and prioritisation of responses is driven by group members. The formation of the stimulus question, however, is crucial to the success of the technique and it is vital that the researcher is clear about what they want to find out from the process. Delbecq, Van de Ven, and Gustafson (1975) compare NGT to using FDM.

In the first step, participants were asked to reflect on something we could do or plan to do as a team to improve health in the community. It was explained that it would have to be a reasonably small project that could be designed and implemented with around \$500 in funds from the available budget. The researcher participated as both a facilitator and participant in the NGT in order to demonstrate the method and to engage as one of the CHIC team. Each participant was given note paper and a pen and was asked to quietly and independently list their ideas. When participants were finished, the notes were collected and all the ideas were transferred to an Excel data sheet that was projected onto a big screen. Each idea was then discussed by the person who suggested it so that everyone was clear about its meaning. Some very similar ideas were combined.

Following the generation, listing and clarification of ideas as described in steps 1 to 3,

participants were asked to rate their favourite ideas using a simplified five-card rating system developed by the present researcher (step 4). This involved giving each person a set of five small, coloured cards consisting of a rating from one to five numbers and stars on each card and asking them to write their five favorite ideas on the cards. The usual procedure in NGT is that all the ideas are rated by each person. Nevertheless, the researcher had used this system on a previous occasion several years ago and found that rating errors were very easily made by participants. For example, some ideas were given the same rating which then confused the whole numbering sequence. A lesson learned was that it is a difficult and lengthy task to rate 50 or so ideas! Moreover, since the aim of the session was to arrive at a single idea for action, there seemed little point in rating every single idea.

Sampling

According to Booker & Mc Namara (2004), experts have acquired their degrees, training, experience, professional membership, and peer recognition via diligent effort and dedication (Nikolopoulos, 2004; Perera et al., 2012). As per the findings of Mullen (2003), an expert is someone with extensive knowledge and expertise in a specific field or industry. The selection of experts is a crucial factor to consider in the NGT technique. If the expert selection process is conducted inadequately and relies on specific criteria, doubts may arise regarding the legitimacy, validity, and reliability of the study's findings (Mustapha & Darussalam, 2017). As per the findings of Kaynak & Macauley (1984), the researchers involved in the study must have expertise or familiarity with the subject matter being investigated. The researcher carefully chooses experts with at least seven years of experience and highly knowledgeable in their specific fields of expertise. These experts are selected based on a rigorous set of criteria that is both demanding and relevant to the study. Therefore, experts with more than 7 years of expertise in their disciplines were chosen for this study. One counseling professor, one education associate professor, four university lecturers actively teaching at public universities, and one psychology lecturer from a private university are all involved. The selection of experts for this study was contingent upon their voluntary participation and decision to engage in the NGT session. The latter will seek an alternative expert in a disagreement between the expert and the researcher. Participants' readiness is a crucial factor for successfully implementing the Nominal Group Technique (NGT) session. It is considered a fundamental criterion within the NGT process. In this research we use 5 experts.

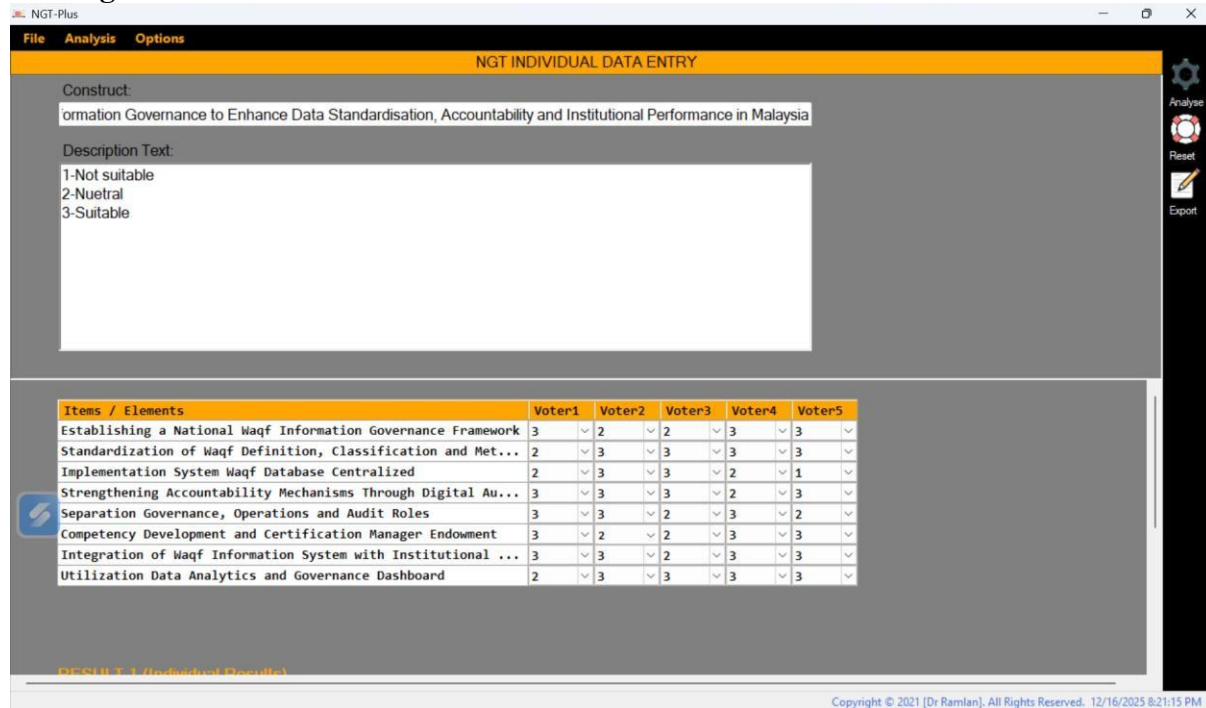
Table 1: Participant profile

Perticipant			Institution
Professor in waqf	3	15 years in field institution waqf	Pubic university
Officer of waqf	2	20 years in field institution waqf	JAWHAR
Officer of waqf	2	15 year in institution waqf	MAIN

Data analysis

In this study the researcher used the NGT process. The data obtained from this process is entered into the NGT-PLUS software during the process. After all the items are discussed by the experts, the voing process is carried out directly in front of all the invited experts. After the experts responded to each item, the NGT-PLUS software was used for data analysis

Findings



Construct:
ormation Governance to Enhance Data Standardisation, Accountability and Institutional Performance in Malaysia

Description Text:
1-Not suitable
2-Nuetral
3-Suitable

Items / Elements	Voter1	Voter2	Voter3	Voter4	Voter5
Establishing a National Waqf Information Governance Framework	3	2	2	3	3
Standardization of Waqf Definition, Classification and Met...	2	3	3	3	3
Implementation System Waqf Database Centralized	2	3	3	2	1
Strengthening Accountability Mechanisms Through Digital Au...	3	3	3	2	3
Separation Governance, Operations and Audit Roles	3	3	2	3	2
Competency Development and Certification Manager Endowment	3	2	2	3	3
Integration of Waqf Information System with Institutional ...	3	3	2	3	3
Utilization Data Analytics and Governance Dashboard	2	3	3	3	3

RESULT 1 (Individual Profiles)

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Figure 1: NGT-Plus Data entry

Table 2: Data Result

Individual Voting Report	
Construct:	Integrated Waqf Information Governance to Enhance Data Standardisation, Accountability and Institutional Performance in Malaysia
Description	1-Not suitable 2-Nuetral 3-Suitable

Items / Elements	Voter1	Voter2	Voter3	Voter4	Voter5	Total item score	Percentage	Rank Priority	Voter Consensus
Establishing a National Waqf Information Governance Framework	3	2	2	3	3	13	86.67	2	Suitable
Standardization of Waqf Definition, Classification and Metadata	2	3	3	3	3	14	93.33	1	Suitable
Implementation System Waqf Database Centralized	2	3	3	2	1	11	73.33	3	Suitable
Strengthening Accountability Mechanisms Through Digital Audits	3	3	3	2	3	14	93.33	1	Suitable
Separation Governance, Operations and Audit Roles	3	3	2	3	2	13	86.67	2	Suitable
Competency Development and Certification Manager Endowment	3	2	2	3	3	13	86.67	2	Suitable
Integration of Waqf Information System with Institutional Performance	3	3	2	3	3	14	93.33	1	Suitable
Utilization Data Analytics and Governance Dashboard	2	3	3	3	3	14	93.33	1	Suitable

** output from the NGT-Plus software

Based on the Nominal Group Technique (NGT) results, all eight proposed items achieved a high level of expert consensus, with percentage scores ranging from 73.33% to 93.33%, indicating that each element was considered suitable for inclusion in the Integrated Waqf Information Governance framework. Items with the highest scores (93.33%), namely *Standardization of Waqf Definition, Classification and Metadata*, *Strengthening Accountability Mechanisms Through Digital Audits*, *Integration of Waqf Information Systems with Institutional Performance*, and *Utilization of Data Analytics and Governance Dashboards*, reflect strong expert agreement that data standardisation, digital accountability, and analytics-driven governance are critical priorities for strengthening waqf information governance. Meanwhile, *Establishing a National Waqf Information Governance Framework* and *Competency Development and Certification of Waqf Managers*, each scoring 86.67%, further underscore the importance of a national governance structure and human capital

development as key enablers of effective implementation. Although *Implementation of a Centralised Waqf Database System* recorded the lowest score (73.33%), it still exceeded the acceptance threshold, suggesting that experts recognise its importance while also acknowledging potential implementation challenges related to institutional readiness and resource constraints. Overall, the NGT findings demonstrate a strong and consistent expert consensus on the relevance and priority of the proposed elements, thereby validating their inclusion in the development of an integrated waqf information governance model in Malaysia.

Table 3: Final output

Construct	Item/Elements
Establishing a National Waqf Information Governance Framework	Develop National Integrated Waqf Information Governance Framework (NIWIGF) which includes : <ul style="list-style-type: none"> • Data policy • Structure ownership information • Standards data quality • Mechanism control and monitoring
Standardization of Waqf Definition, Classification and Metadata	Problem : Definition assets , income and status of waqf different between Institutions . Solution : Creating waqf data dictionary & standard metadata includes : <ul style="list-style-type: none"> • Types of endowments • Legal status • Economic value • Development status
Implementation System Waqf Database Centralized	Problem : Record asset endowment split and not complete . Solution : Develop Centralized Digital Waqf Asset Registry which: <ul style="list-style-type: none"> • Integrated interstate • Updated in real time • Yes audited
Strengthening Accountability Mechanisms Through Digital Audits	Problem : Financial audit and information no consistent . Solution <ul style="list-style-type: none"> • Digital sharia audit • Data audit (data accuracy, completeness, timeliness) Performance audit endowment
Separation Governance, Operations and Audit Roles	Problem : Conflict interest deep management waqf Solution : Separating : <ul style="list-style-type: none"> • Holder trustee • Manager operation • Audit & monitoring unit fre
Competency Development and Certification Manager	Problem : Disadvantages expertise professional Solution :

Endowment	<ul style="list-style-type: none"> • Certification national manager endowment • Training in data governance, MIS and shari
Integration of Waqf Information System with Institutional Performance	<p>Problem : Data is not used for make decision .</p> <p>Solution :</p> <p>Connecting :</p> <ul style="list-style-type: none"> • Waqf data → KPI • Data → planning strategic • Data → performance social & economic
Utilization Data Analytics and Governance Dashboard	<p>Problem : Static data and no analytical .</p> <p>Solution :</p> <ul style="list-style-type: none"> • Performance dashboards endowment • Analytics prediction (predictive analytics) • <u>Monitoring result endowment</u>

The table outlines an integrated framework for strengthening waqf governance through systematic information management and digitalization. It begins with the establishment of a National Integrated Waqf Information Governance Framework (NIWIGF), which provides a unified foundation through clear data policies, structured information ownership, data quality standards, and control and monitoring mechanisms. To address inconsistencies in waqf definitions, asset classifications, income reporting, and legal status across institutions, the framework proposes standardising waqf definitions through a national waqf data dictionary and standard metadata covering endowment types, legal status, economic value, and development status. In response to fragmented and incomplete asset records, a centralized digital waqf asset registry is proposed, enabling interstate integration, real-time updates, and audit-ready records. Accountability is further enhanced through digital Shariah audits, data audits focusing on accuracy, completeness, and timeliness, as well as performance audits of waqf endowments. To mitigate conflicts of interest, the framework emphasizes the separation of governance, operational management, and independent audit and monitoring functions. Recognising the shortage of professional expertise, it also highlights the need for national certification and continuous training of waqf managers in data governance, management information systems, and Shariah compliance. Finally, the framework promotes the integration of waqf information systems with institutional performance by linking data to key performance indicators, strategic planning, and social and economic outcomes, supported by data analytics and governance dashboards that enable performance monitoring, predictive analysis, and evidence-based decision-making.

IWIG-PERFORM Model

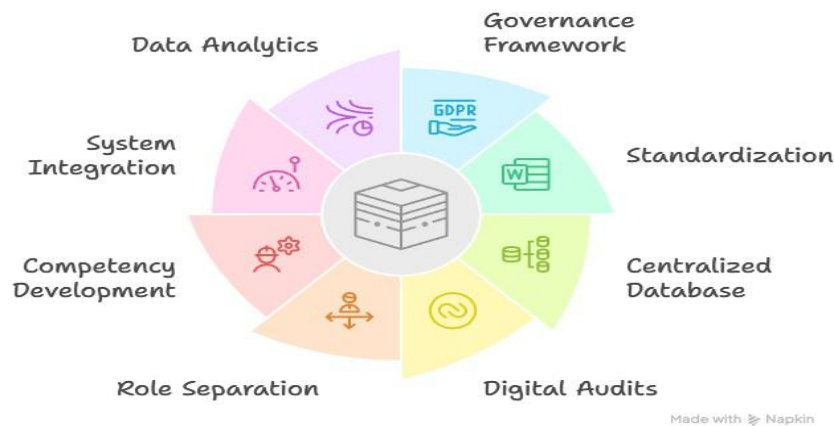


Figure 2: IWIG-Perform Model

Discussion and conclusion

The findings of this study underscore the central role of integrated information governance in addressing long-standing structural and operational challenges faced by waqf institutions in Malaysia. The high level of expert consensus across all eight proposed elements demonstrates a shared recognition that waqf governance challenges are no longer merely administrative or legal in nature, but are fundamentally rooted in weaknesses in information management, data utilisation, and accountability systems.

The strongest support was observed for elements related to data standardisation, digital accountability, and performance integration, reflecting experts' acknowledgement that inconsistent definitions, fragmented databases, and weak reporting mechanisms significantly hinder effective waqf governance. The prioritisation of *Standardisation of Waqf Definition, Classification and Metadata* highlights the urgency of resolving discrepancies across institutions and states, which currently obstruct national-level reporting, benchmarking, and policy formulation. Without a unified data dictionary and metadata standards, waqf information remains siloed, limiting its strategic value and increasing the risk of asset mismanagement.

Similarly, the strong endorsement of *Strengthening Accountability Mechanisms Through Digital Audits* and *Utilisation of Data Analytics and Governance Dashboards* indicates a paradigm shift towards technology-enabled accountability. Experts recognised that traditional financial audits alone are insufficient for modern waqf governance, advocating instead for integrated digital Shariah audits, data audits, and performance audits. These mechanisms not only enhance transparency but also reinforce Islamic accountability by ensuring continuous compliance with waqf objectives and waqif intentions.

The establishment of a National Waqf Information Governance Framework was also viewed as a critical institutional enabler. This reflects the need for coordinated governance at the federal level to harmonise practices across State Islamic Religious Councils while respecting Malaysia's constitutional structure. Such a framework provides the necessary policy backbone

for standard-setting, monitoring, and enforcement, thereby reducing governance fragmentation and enhancing institutional coherence.

Human capital development emerged as another key theme, as evidenced by strong support for *Competency Development and Certification of Waqf Managers*. Experts highlighted that sophisticated information systems and governance frameworks cannot function effectively without professionally trained managers who possess competencies in Shariah, data governance, management information systems, and strategic planning. This finding reinforces prior literature that identifies capacity constraints as a major barrier to waqf modernisation.

Although the *Implementation of a Centralised Digital Waqf Asset Registry* received the lowest relative score, it still exceeded the acceptance threshold, indicating broad recognition of its importance alongside concerns regarding implementation readiness, funding, and interoperability challenges. This suggests that while centralisation is essential for comprehensive asset visibility and protection, its success depends on phased implementation, institutional commitment, and supporting governance structures.

Overall, the findings validate the proposed Integrated Waqf Information Governance model as a holistic approach that aligns technological innovation with Islamic governance principles, institutional accountability, and performance orientation. The model positions data not merely as an administrative record, but as a strategic asset for decision-making, impact assessment, and sustainable waqf development.

Future Research

The findings of this study reveal significant opportunities for advancing the field of waqf information governance through systematic research initiatives that address existing theoretical gaps and practical implementation challenges. First and foremost, there is a critical need for longitudinal implementation studies that track the actual deployment of integrated waqf information governance frameworks over extended periods of three to five years. Such research would provide empirical evidence regarding the effectiveness of proposed governance interventions, identify implementation barriers and success factors across diverse institutional contexts, and measure tangible outcomes in terms of data quality improvements, accountability enhancements, and institutional performance gains. Furthermore, comparative evaluation research examining different implementation approaches across Malaysian states would yield valuable insights into context-specific factors that influence governance reform success, enabling the development of evidence-based best practice guidelines that account for variations in institutional capacity, technological readiness, regulatory environments, and organizational cultures. These longitudinal and comparative studies should employ mixed-methods approaches combining quantitative performance metrics with qualitative case studies to capture both measurable outcomes and nuanced implementation experiences, thereby providing comprehensive understanding of how integrated information governance transforms waqf institutional capabilities and stakeholder relationships over time.

A second critical research direction involves investigating cross-jurisdictional coordination mechanisms that can harmonize waqf information governance practices across Malaysia's federalized Islamic administration structure while respecting constitutional arrangements regarding religious authority. Current research predominantly focuses on individual institutions or single states, leaving substantial knowledge gaps regarding national-level standardization strategies, interoperability solutions for connecting disparate state-level systems, and federal-state coordination frameworks for governance oversight. Future studies should examine how common data standards, shared technology platforms, and coordinated reporting frameworks can be established through collaborative governance arrangements that balance standardization benefits with state autonomy principles. Additionally, research exploring international

comparative perspectives would illuminate alternative approaches to waqf information governance adopted in other Muslim-majority countries such as Singapore, Indonesia, Turkey, and Gulf states, enabling cross-national learning and adaptation of successful governance models to Malaysian context. Such comparative research should analyze not only technological and administrative dimensions but also legal frameworks, regulatory enforcement mechanisms, and stakeholder engagement strategies, providing holistic understanding of governance ecosystems that enable effective waqf management while maintaining religious authenticity and public trust. Third, there exists substantial need for stakeholder-centric research that systematically investigates the perspectives, needs, and expectations of diverse actors within the waqf ecosystem beyond the institutional administrative viewpoint that dominates current literature. Beneficiary-focused studies should examine how improved information governance affects service delivery quality, accessibility, and satisfaction among waqf recipients, identifying specific information needs and preferred communication channels that can inform user-centered system design. Donor behavior research should investigate how transparency mechanisms, information disclosure practices, and impact reporting influence charitable contribution decisions, trust formation, and willingness to establish new waqf endowments, providing empirical basis for designing accountability systems that effectively build public confidence and stimulate sector growth. Furthermore, comprehensive public perception surveys measuring societal attitudes toward waqf institutions, trust levels in governance structures, and expectations regarding transparency and accountability would illuminate demand-side factors that should shape governance framework development. This stakeholder research should employ diverse methodological approaches including surveys, focus groups, behavioral experiments, and social media analysis to capture multifaceted perspectives across different demographic segments, geographic regions, and levels of religious engagement, ensuring that governance reforms respond to authentic stakeholder needs rather than institutional assumptions.

Fourth, the rapid evolution of digital technologies creates urgent research imperative to investigate emerging technological applications and their implications for waqf information governance. Blockchain technology research should move beyond conceptual proposals to conduct rigorous pilot implementations examining technical feasibility, cost-effectiveness, stakeholder acceptance, and Islamic jurisprudential compatibility of distributed ledger systems for transparent transaction recording, automated compliance monitoring through smart contracts, and cross-border waqf contribution facilitation. Artificial intelligence applications warrant systematic investigation regarding predictive analytics for asset management optimization, machine learning algorithms for fraud detection and risk assessment, natural language processing for automated document analysis and classification, and intelligent decision support systems for strategic planning and resource allocation. Additionally, research on cloud computing adoption should provide detailed cost-benefit analyses, security risk assessments, and implementation roadmaps specifically tailored to waqf institutional contexts, addressing concerns regarding data sovereignty, vendor dependency, and system reliability that may impede technology adoption. However, such technology-focused research must maintain critical perspective, examining not only technical capabilities but also governance prerequisites, capacity requirements, regulatory considerations, and potential unintended consequences, ensuring that technological solutions serve rather than overwhelm institutional capabilities and religious values.

Finally, interdisciplinary research approaches integrating perspectives from information science, Islamic finance, public administration, organizational behavior, and data analytics would generate more comprehensive and nuanced understanding of waqf information governance than can be achieved through single-discipline investigations. Future research should examine the interplay between technological infrastructure, organizational culture, regulatory frameworks,

human capital capabilities, and stakeholder dynamics in shaping governance outcomes, employing systems thinking methodologies that capture complex interdependencies and feedback loops within waqf ecosystems. Performance measurement research should develop comprehensive frameworks that assess not merely financial efficiency but also social impact, Shariah compliance fidelity, beneficiary welfare improvements, and contribution to sustainable development goals, providing multidimensional accountability metrics aligned with Islamic principles of holistic success. Furthermore, capacity building research should investigate optimal strategies for professional development of waqf administrators, examining effectiveness of different training modalities, certification schemes, knowledge management platforms, and organizational learning mechanisms in enhancing information governance competencies. These diverse research streams would collectively advance both theoretical understanding and practical capabilities in waqf information governance, ultimately contributing to institutional strengthening that enables Malaysian waqf institutions to fulfill their religious obligations, maximize social impact, and serve as models for Islamic philanthropic excellence in contemporary digital age.

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