Digital Transformation in Waqf: A Bibliometric Analysis and Thematic Mapping of Current Trends and Future Frontiers

Mohd Yassir Jaaffar, Mohd Amran Mahat*, Jismi Md Salleh, Mohd Ariff Mustafa

Faculty of Accountancy, UiTM Cawangan Melaka, Malaysia

***Corresponding Author**

DOI: https://doi.org/10.47772/IJRISS.2026.101000329

Received: 14 October 2026; Accepted: 19 October 2026; Published: 02 November 2026

ABSTRACT

This study investigates the intellectual landscape, collaborative networks, and thematic evolution of scholarship at the intersection of waqf and digital transformation. Using bibliographic data retrieved from the Scopus database covering 2015 to 2026, a bibliometric and keyword co-occurrence analysis of 99 peer-reviewed publications was performed using VOSviewer. The findings reveal that research output progressed from an exploratory baseline into a phase of rapid acceleration catalyzed by the COVID-19 pandemic, with publications peaking in 2025 and 82.8% of the literature emerging between 2022 and 2026. The research landscape is heavily concentrated in Southeast Asia, with Indonesia (53.5%) and Malaysia (45.5%) serving as the primary intellectual hubs and forming the central bilateral collaboration corridor. Thematic mapping delineated three dominant conceptual clusters: (1) digital waqf mobilization and innovative infrastructure centered on crowdfunding, cash waqf, and blockchain verification; (2) macro-level Islamic FinTech integration supporting financial inclusion and the Sustainable Development Goals (SDGs); and (3) Islamic social finance synergies linking waqf and zakat ecosystems. Crucially, the review identifies an "adoption–impact gap," wherein scholarship is disproportionately skewed toward conceptual models and pre-implementation donor intention frameworks (e.g., TAM and UTAUT), with scarce empirical inquiry into post-implementation operational efficiency, administrative cost reductions, or measurable socioeconomic outcomes for beneficiaries. Furthermore, advanced artificial intelligence remains an uncharted empirical frontier. This study provides waqf trustees (mutawallis), FinTech innovators, and policymakers with actionable insights to shift from basic digital fundraising toward scalable, Shariah-compliant digital governance.

Keywords: Waqf, Digital transformation, FinTech, Blockchain, Crowdfunding, Islamic social finance, Bibliometric analysis, VOSviewer

INTRODUCTION

Background and Motivation

Waqf is a cornerstone institution within Islamic social finance, historically dedicated to addressing socioeconomic challenges such as poverty alleviation, healthcare, education, and community development. While traditional waqf was predominantly anchored in immovable real estate, modern innovations such as cash waqf and waqf-linked financial instruments have introduced greater liquidity and operational flexibility to mobilize capital. Over the past decade, this evolution has gained substantial traction among scholars, policymakers, and philanthropic organizations seeking scalable, sustainable financing models.

As waqf institutions expand in operational scope and socioeconomic complexity, ensuring transparency, donor trust, and administrative efficiency has become a critical challenge. Traditional, paper-based administration and manual fundraising often struggle to meet the expectations of contemporary, digitally engaged stakeholders. Consequently, digital transformation—driven by financial technology (FinTech), crowdfunding platforms, blockchain traceability, and emerging artificial intelligence—has emerged as an indispensable pathway to modernize waqf governance, expand resource mobilization, and ensure robust institutional

accountability. The strategic convergence of digital technology and waqf management has thus become an urgent priority in both academic research and operational practice.

Research Gap

Despite the growing body of literature on waqf and Islamic social finance, research examining its intersection with digital transformation remains fragmented and technologically compartmentalized. Most existing studies focus primarily on conceptual models or donor adoption intentions through frameworks like TAM and UTAUT, offering limited empirical evidence on post-implementation operational efficiency, institutional governance, or measurable socioeconomic impact. Moreover, distinct technological applications such as crowdfunding platforms, FinTech infrastructure, blockchain verification, and emerging artificial intelligence have largely been investigated in isolation rather than within an integrated digital ecosystem.

Consequently, there is a lack of comprehensive bibliometric synthesis that quantitatively tracks how this interdisciplinary domain has evolved over time. A systematic mapping is needed to identify influential publications, uncover collaborative networks across key jurisdictions, and delineate the thematic clusters and intellectual frontiers shaping the digital transformation of waqf

Objective of the Study

This study addresses the aforementioned gaps by conducting a comprehensive bibliometric and keyword co-occurrence analysis of scholarly research on waqf and digital transformation published between 2015 and 2026. The primary objective is to map the intellectual landscape and evolutionary trajectory of this domain by quantitatively evaluating publication and citation trends, leading country contributors and collaboration networks, high-impact literature, and dominant thematic clusters.

Scope of the Study

The study is based on bibliographic data retrieved from the Scopus database, using a tailored Boolean search strategy to ensure the inclusion of relevant studies intersecting waqf and digitalisation. VOSviewer is employed as the analytical tool to visualize co authorship networks, keyword co-occurrence clusters, citation dynamics, and research trends.

The study is guided by the following research questions:

RQ1: What are the publication and citation trends in waqf and digital transformation/AI research?

RQ2: Which countries have made the most significant contributions to this field?

RQ3: What are the most cited and high impact publications shaping this research domain?

RQ4: What are the dominant themes and emerging research hotspots identified through keyword co-occurrence and thematic mapping?

Contribution to Knowledge

This study contributes to the Islamic social finance literature by delivering a comprehensive bibliometric and thematic mapping of digital waqf research from 2015 to 2026. By quantitatively analyzing publication trajectories, regional collaboration networks, and keyword structures, it unifies previously fragmented discussions on crowdfunding, FinTech, blockchain, and AI into an integrated conceptual architecture. Additionally, the findings advance the scholarly agenda by exposing critical research gaps—most notably the heavy reliance on conceptual frameworks and behavioral adoption models (such as TAM and UTAUT) at the expense of empirical, post-implementation impact studies. This provides researchers, waqf trustees (mutawallis), and policymakers with a clear roadmap for transitioning from digital fundraising toward scalable, Shariah-compliant digital governance.

LITERATURE REVIEW

Waqf Modernisation and the Imperative for Digital Transformation

Waqf has evolved from a traditional philanthropic institution centered on immovable property into a dynamic instrument for socioeconomic development, poverty alleviation, and sustainable financing. Recent innovations such as productive waqf, cash waqf, and waqf-linked sukuk demonstrate its growing capacity to mobilize liquid capital and integrate with contemporary Islamic capital markets (Hosen et al., 2022; Iman & Mohammad, 2017; Syarifuddin, 2024). However, the sector faces persistent operational bottlenecks, including fragmented governance, administrative inefficiencies, limited transparency, and liquidity constraints in developing endowed assets.

These structural challenges, coupled with shifting donor expectations for transparency and convenience, have driven the transition from basic digitisation (converting records to electronic formats) toward comprehensive digital transformation. The COVID-19 pandemic further accelerated this transition, underscoring the critical necessity of digital platforms to sustain philanthropic mobilization amid physical restrictions (Piliyanti et al., 2022). Consequently, digital transformation in waqf represents an institutional paradigm shift that redefines how philanthropic resources are collected, administered, governed, and distributed.

Core Technological Streams: Crowdfunding, FinTech, Blockchain, and AI

Scholarly inquiry at the intersection of waqf and technology has developed across four interrelated streams:

- Crowdfunding and Digital Mobilisation: Crowdfunding is the most mature digital mechanism in waqf scholarship, primarily addressing liquidity shortages in waqf land and asset development (Thaker, 2018; Thaker & Pitchay, 2018). Studies in this stream rely heavily on behavioural intention models—such as the Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT)—to identify key adoption determinants, including perceived usefulness, perceived ease of use, trust, and religious orientation (Masrizal et al., 2023; Thaker et al., 2018).

- FinTech and Ecosystem Integration: Moving beyond fundraising, Islamic FinTech provides the broader digital infrastructure required to integrate waqf with electronic payments, digital banking, and Islamic microfinance. This stream emphasizes the role of digital financial services in advancing financial inclusion and supporting the United Nations Sustainable Development Goals (SDGs) (Hudaefi, 2020). FinTech adoption shifts waqf from isolated operational models into an interconnected Islamic social finance architecture.

- Blockchain and Smart Contracts: Distributed ledger technology (DLT) is primarily examined as a governance and accountability solution. Researchers highlight blockchain's decentralised, immutable characteristics for verifying asset ownership, tracking cash flows, and eliminating agency problems (Mohaiyadin et al., 2022). Furthermore, smart contracts offer the potential to automate endowment disbursement and enforce donor stipulations with minimal administrative friction.

- Emerging Artificial Intelligence (AI): AI represents an emergent frontier transitioning waqf management from digital transaction processing toward intelligent decision support. Recent studies explore AI applications in automated beneficiary identification, predictive fund allocation, and administrative analytics (Agaileh, 2024; Johari, 2025). However, scholarship in machine learning, deep learning, and large language models remains nascent, accompanied by unresolved questions regarding algorithmic fairness, data ethics, and human oversight.

Governance Challenges, Shariah Compliance, and the Adoption–Impact Gap

Implementing digital technology within waqf introduces critical institutional, regulatory, and Shariah considerations. Because waqf is strictly governed by fiduciary obligations and Islamic jurisprudence, digital

innovations—particularly smart contracts and automated investments—must align with Maqasid al-Shariah (the higher objectives of Islamic law) to protect endowment assets (asl) and preserve donor intent. Additionally, waqf institutions face significant operational risks regarding cybersecurity, donor data privacy, and unequal digital literacy among vulnerable beneficiaries.

Synthesizing this literature reveals a critical scholarly imbalance: research remains heavily saturated with conceptual frameworks and pre-implementation adoption models (TAM/UTAUT) focused on donor perceptions. Substantially less empirical inquiry investigates actual post-adoption performance, operational cost efficiency, or measurable socioeconomic outcomes for beneficiaries. Furthermore, scholarship remains geographically clustered around Southeast Asia, leaving the broader global landscape underexplored. A quantitative bibliometric mapping is therefore necessary to systematically evaluate the intellectual trajectories, collaborative networks, and emerging research fronts across this rapidly developing domain.

METHODOLOGY

Bibliometric Analysis

This component emphasizes the use of bibliometric indicators and mapping techniques to explore the structure, productivity, and intellectual development of literature concerning cash waqf and cost management. Bibliometric analysis provides a quantitative method for assessing scholarly output, citation influence, and the evolution of research themes over time.

Publication output was examined by analyzing the number of publications per year, highlighting trends in academic interest and identifying key phases in the progression of the research area. Keyword co-occurrence analysis was conducted based on author supplied keywords. By mapping the frequency with which terms appear together, this method reveals thematic c lusters and research hotspots, offering insights into the conceptual framework of the field.

Procedural Analysis

The data for this study were obtained from Scopus, a leading multidisciplinary abstract and citation database. A tailored Boolean search stringwas constructed to capture the conceptual scope of the research domain. The query used was:

TITLE-ABS-KEY(waqf OR wakaf OR awqaf OR auqaf) AND TITLE-ABS-KEY("digital transformation" OR digitali?ation OR digitalisation OR digitisation OR "digital technology" OR "digital technologies" OR fintech OR "Islamic fintech" OR blockchain OR "smart contract" OR crowdfunding OR "digital platform" OR "artificial intelligence" OR "machine learning" OR "deep learning" OR "generative AI" OR "large language model" OR "explainable AI")

Several inclusion criteria guided the selection process. Only English-language publications were considered. The document types were limited to peer-reviewed journal articles and review papers. No specific lower time limit was imposed, although the search was capped at the year 2026.

Data retrieval was conducted on 28 August 2026. This date is recorded to ensure transparency and facilitate reproducibility of the study. The metadata extracted from Scopus included article titles, abstracts, author names, institutional affiliations, keywords, publication years, journal sources, and citation counts. Figure 1 illustrates the selection and screening process, which led to the inclusion of 99 publications after applying inclusion and exclusion criteria.

The bibliometric mapping was carried out using VOSviewer Version 1.6.20 (released in late 2024), developed by Van Eck and Waltman (2010). The software supports network construction and visualization for co-authorship, co-citation, and keyword co-occurrence analysis. It uses a force-directed layout algorithm to spatially organize clusters based on the strength of item links.

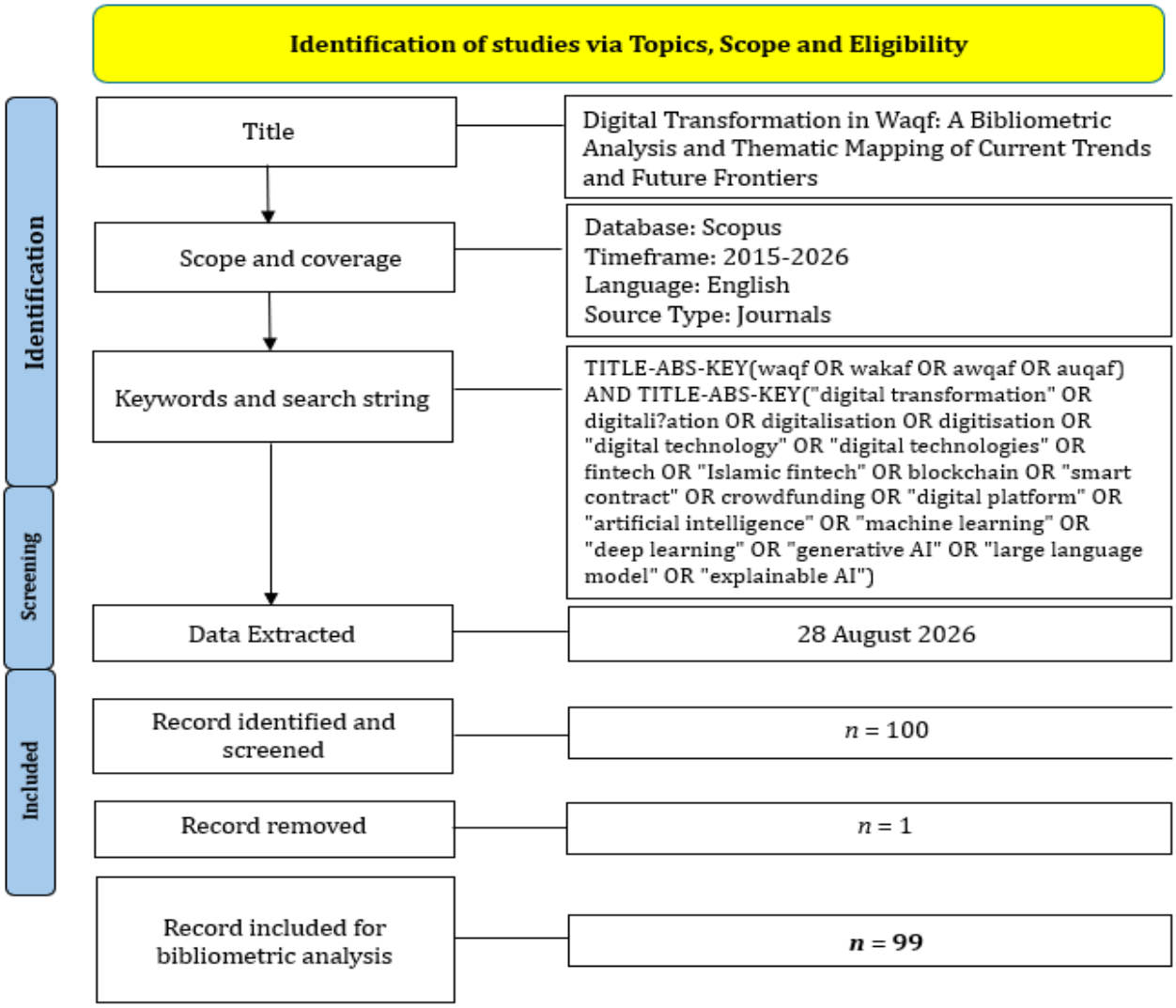

Fig 1. The Study Flowchart

RESULT

This section presents the findings of the bibliometric analysis, structured into descriptive analytics, productivity and impact indicators, collaboration networks, and thematic structure analysis based on bibliographic coupling and keyword co-occurrence.

RQ1: What are the publication and citation trends in waqf and digital transformation/AI research?

Figure 2 illustrates the annual distribution of total publications (TP) and total citations (TC) for research related to waqf and and digital transformation/AI research from 2015 to 2026.

The annual publication trend indicates that research on waqf in relation to digital transformation and emerging technologies, including artificial intelligence, has expanded substantially over the study period. A total of 99 publications were identified between 2015 and 2026. The literature was very limited during the initial period, with only one publication in 2015, no publications in 2016, and one publication in 2017. Publication output subsequently increased to four papers in 2018, although it declined to two in 2019.

From 2020 onwards, the literature began to demonstrate a more sustained upward trajectory. The number of publications increased from 5 in 2020 to 9 in 2022, followed by a further rise to 13 in 2023 and 14 in 2024. The most substantial expansion occurred in 2025, when publication output more than doubled to 29 publications, representing the highest annual productivity in the dataset. This sharp increase suggests that the intersection between waqf and digital technologies has entered a period of accelerated scholarly attention.

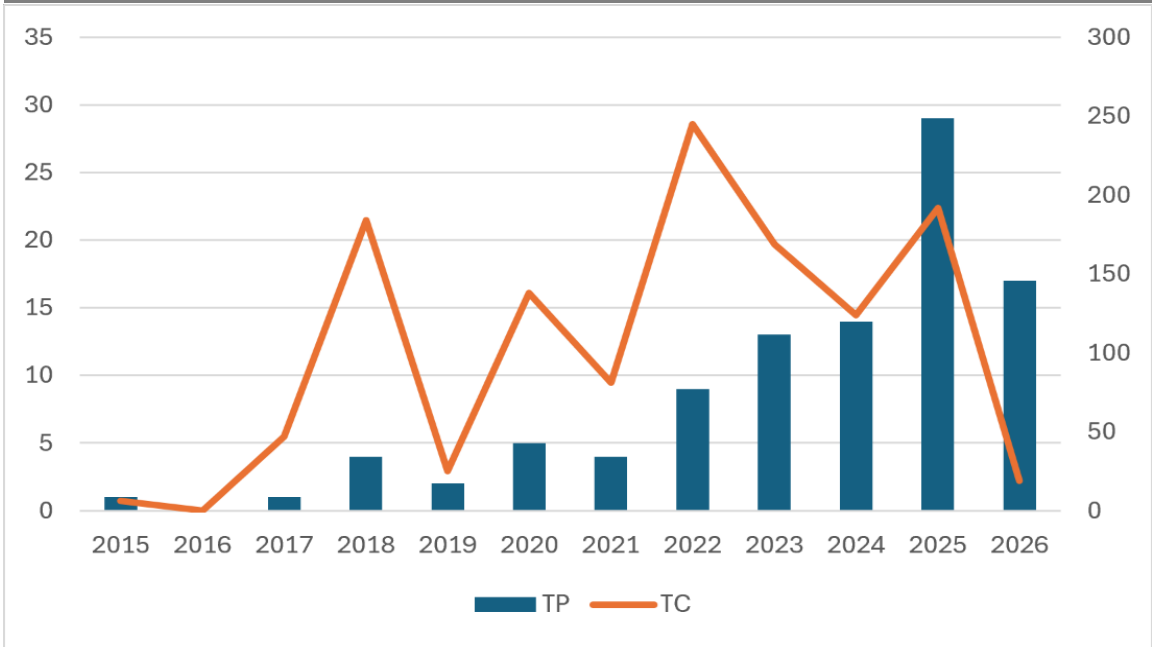

Fig. 2. The Publication Trends

The data also show that the majority of the literature has emerged in the most recent years. Publications from 2022–2026 account for 82 of the 99 publications (82.8%), demonstrating that this is a relatively recent and rapidly developing research field. In particular, 2023–2025 alone produced 56 publications, equivalent to approximately 56.6% of the entire dataset.

The citation pattern provides additional evidence of scholarly impact, although it should be interpreted separately from publication productivity. The highest total citation count was recorded in 2022 (245 citations), followed by 2018 (184) and 2025 (192). Interestingly, the increase in publication volume after 2022 has not been accompanied by a proportional increase in citations. For example, publications increased from 14 in 2024 to 29 in 2025, while total citations increased from 124 to 192. This may reflect the recency effect, whereby newer publications have had less time to accumulate citations.

The 17 publications recorded for 2026 should be interpreted cautiously, since the year is incomplete and therefore cannot be directly compared with completed years such as 2024 or 2025. The relatively low citation count of 19 in 2026 is likewise expected to be affected by the short citation window.

RQ2: Which countries have made the most significant contributions to this field?

Analysis of the 99 Scopus-indexed publications published between 2015 and 2026, representing 22 contributing countries, shows a strong geographical concentration of research on waqf and digitalisation in Indonesia and Malaysia.

Indonesia is the leading contributor, with 53 publications (53.5%), followed by Malaysia with 45 publications (45.5%). Other contributing countries include Pakistan and Saudi Arabia with five publications each (5.1%), the United Kingdom with four (4.0%), and Turkey, the United Arab Emirates, the United States, Bahrain, and India with three publications each (3.0%). This distribution demonstrates the clear dominance of Southeast Asia, particularly Indonesia and Malaysia, in the development of research on digital waqf.

The collaboration pattern further reinforces this concentration. Of the 99 publications, 60 (60.6%) were single-country studies, while 39 (39.4%) involved international collaboration. The strongest bilateral collaboration was between Indonesia and Malaysia, with 14 publications, followed by Indonesia–Saudi Arabia (5), Malaysia–United Kingdom (3), Malaysia–Pakistan (2), and Indonesia–Thailand (2). Thus, the Indonesia–Malaysia relationship represents the principal collaborative axis in the field.

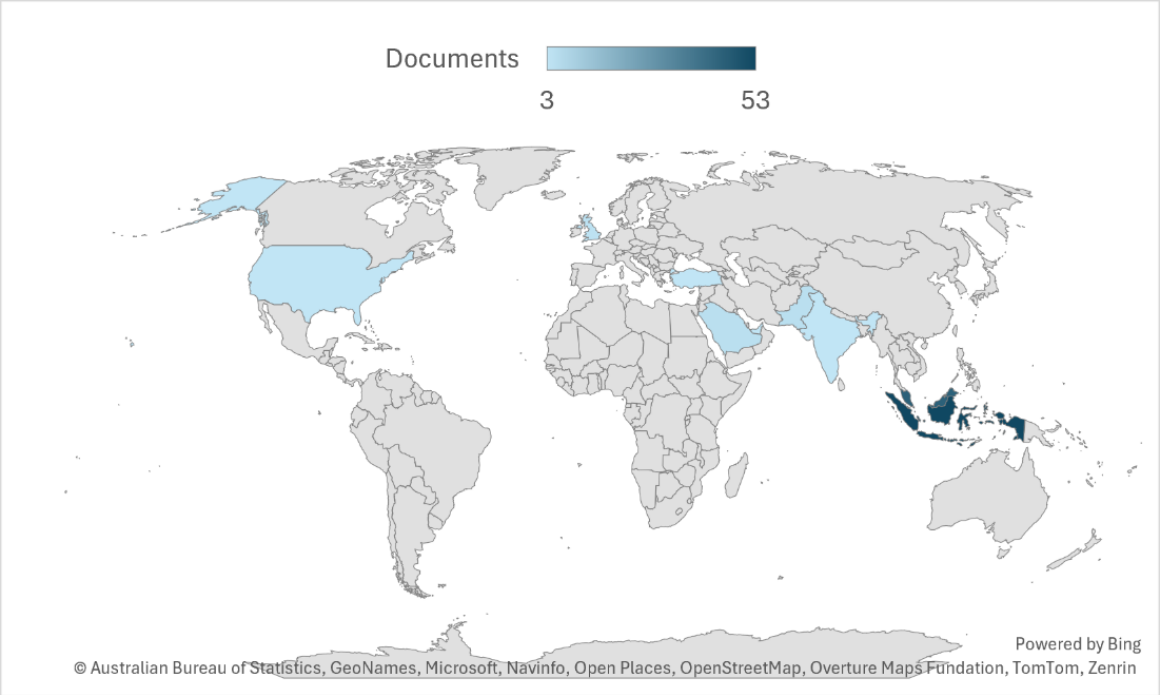

Fig. 3. Number of Publications by Countries

The temporal pattern also indicates rapid growth in research activity. Indonesia's publications increased substantially from 1 in 2020 to 18 in 2025, while Malaysia demonstrated an earlier and more consistent research presence, increasing from 1 publication in 2017 to 11 in 2025. Both countries recorded eight publications in 2026, indicating sustained research momentum. This growth coincides with increasing scholarly attention to digital platforms, fintech, crowdfunding, and blockchain applications in waqf.

Overall, the findings indicate that Indonesia and Malaysia are the principal research hubs for waqf and digitalisation, with a strong Indonesia–Malaysia collaboration network. Although contributions from other countries demonstrate growing international interest, research remains predominantly concentrated in Southeast Asia, reflecting the region's significant role in advancing the digitalisation of waqf and Islamic social finance.

RQ3: What are the most cited and high impact publications shaping this research domain?

The citation analysis shows that the research domain is shaped by a relatively small group of influential publications, with the top ten receiving 36–113 citations. Overall, the high-impact literature reflects three interconnected streams: Islamic fintech and social finance, crowdfunding-waqf and technology adoption, and emerging blockchain applications.

The most cited study, How does Islamic fintech promote the SDGs? Qualitative evidence from Indonesia, received 113 citations and establishes the broader link between Islamic fintech, financial inclusion and sustainable development. It is followed by The role of Islamic social finance during Covid-19 pandemic in Indonesia’s economic recovery (99 citations), which highlights Shariah-based equity crowdfunding as a mechanism for financial support, justice and transparency during the pandemic.

More directly related to digital waqf, Modeling crowdfunders’ behavioral intention to adopt the crowdfunding-waqf model (CWM) in Malaysia ranks third with 77 citations. Using TAM and 1,000 respondents, the study establishes perceived usefulness and perceived ease of use as important determinants of crowdfunding-waqf adoption. Other highly cited studies similarly examine waqf participation, crowdfunding adoption and waqf land development, demonstrating the centrality of donor behaviour and crowdfunding as the dominant digital research stream.

The remaining highly cited publications broaden the field toward entrepreneurship, Islamic microfinance and sustainable waqf financing. Studies on waqf and entrepreneurship, SME participation in waqf, Islamic microfinance and crowdfunding-based waqf land development collectively demonstrate that the field extends beyond technology itself to issues of participation, financial inclusion, liquidity constraints and socioeconomic development.

Finally, the inclusion of Implementing the Blockchain Technology in Islamic Financial Industry: Opportunities and Challenges (36 citations) signals the emergence of blockchain as an important technological direction, particularly for enhancing security, transparency and crowdfunding within Islamic finance.

Overall, the citation pattern indicates that crowdfunding, fintech and technology-adoption research currently exert the strongest intellectual influence, while blockchain represents an emerging extension toward transparency and digital infrastructure. The dominance of studies from Malaysia and Indonesia also highlights Southeast Asia's important role in shaping this research domain. At the same time, the relatively limited representation of advanced technologies indicates that the field is still transitioning from digital fundraising and adoption toward broader digital transformation of waqf institutions and ecosystems.

Table 1. Top 10 Most Cited Articles

Rank	Title	Significant Contributions	Citation
1	How does Islamic fintech promote the SDGs? Qualitative evidence from Indonesia	This study defines Islamic fintech and demonstrates its role in advancing the Sustainable Development Goals (SDGs) by promoting financial inclusion for SMEs and agriculture, while distributing Islamic social funds to reduce poverty and inequality	113
2	The role of Islamic social finance during Covid-19 pandemic in Indonesia's economic recovery	This research identifies sharia-based equity crowdfunding as a vital tool for SMEs during the pandemic, emphasizing its ability to provide financial assistance while adhering to principles of justice and transparency	99
3	Modeling crowdfunders' behavioral intention to adopt the crowdfunding-waqf model (CWM) in Malaysia: The theory of the technology acceptance model	Using structural equation modeling on 1,000 respondents, this study validates the Technology Acceptance Model (TAM) to explain how perceived usefulness and ease of use drive donor intentions to support waqf land development	77
4	Waqf as a framework for entrepreneurship	This paper (represented by the study on Nigerian entrepreneurs) proposes a model for business development by demonstrating that cash waqf awareness and positive attitudes are critical mediators for entrepreneurship growth	47
5	The intention of small and medium enterprises' owners to participate in waqf: the case of Malaysia and Indonesia	This research analyzes 175 SME owners to reveal that knowledge and attitude significantly influence participation in waqf, whereas religiosity does not have a statistically significant impact on these intentions	46
Rank	Title	Significant Contributions	Citation
6	Factors influencing the adoption of the crowdfunding-waqf model (CWM) in the waqf land development	This study explores the viability of the CWM to address liquidity constraints in Malaysian waqf institutions, finding high donor willingness, particularly among female and low-to-middle income	42

		demographics	
7	Determinant factor of crowdfunders' behavior in using crowdfunding waqf model in Indonesia: two competing models	This study examines the behavioral intentions of donors in Klang Valley, Malaysia, confirming that perceived usefulness and ease of use are key determinants for adopting the CWM in waqf land development	41
8	A review on literature of Islamic microfinance from 2010-2020: lesson for practitioners and future directions	This research investigates the factors influencing young SME leaders to adopt Islamic microfinance, contributing to the literature by merging existing theoretical models with new variables to assess adoption behavior.	40
9	Developing waqf land through crowdfunding-waqf model (CWM): the case of Malaysia	This paper contributes a sustainable financing framework for waqf institutions, demonstrating that CWM can mitigate liquidity issues and reduce government reliance for land development	37
10	Implementing the Blockchain Technology in Islamic Financial Industry: Opportunities and Challenges	This study argues that blockchain technology serves as a critical bridge for Islamic finance, offering a secure, interest-free digital foundation that enhances crowdfunding and mitigates the risks associated with debt-based financing	36

RQ4: What are the dominant themes and emerging research hotspots identified through keyword co-occurrence and thematic mapping?

To uncover the conceptual structure and intellectual evolution of the literature, a keyword co-occurrence analysis was conducted using VOSviewer. Based on a minimum occurrence threshold, 11 primary keywords met the criteria, forming a network connected through 33 co-occurrence links with a total link strength of 124. The resulting network visualization reveals three distinct thematic clusters that capture how digital mechanisms interact with the waqf ecosystem.

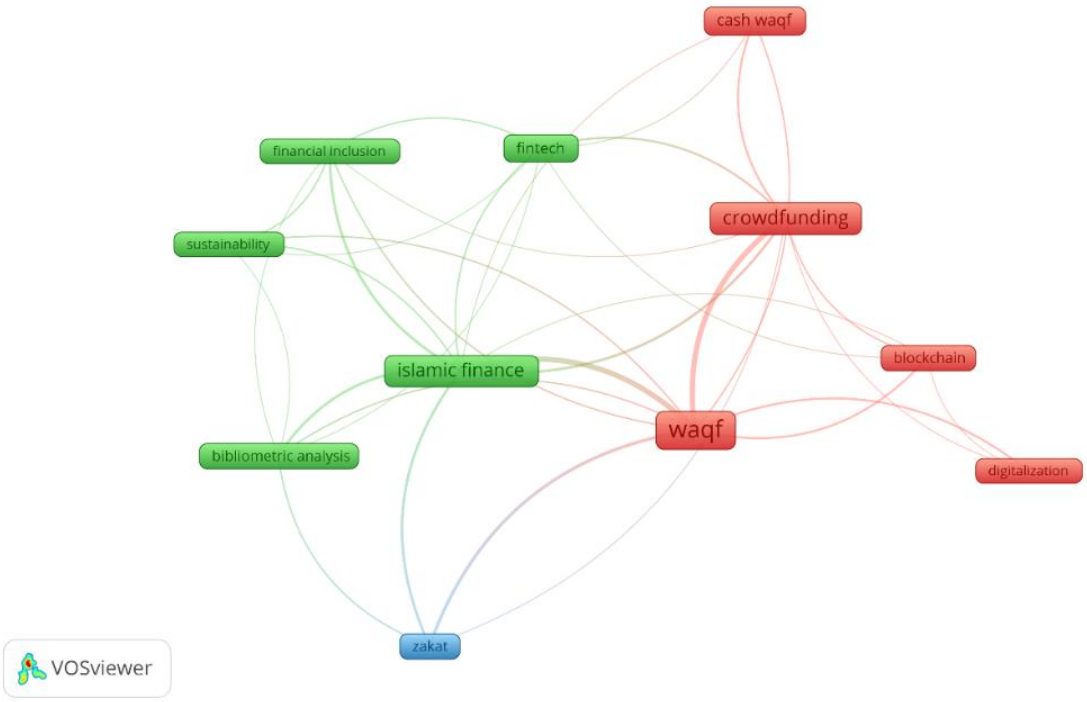

Fig. 4. VOSviewer-based Co-occurrence Map

As illustrated in Figure 4, the strongest single relationship in the network links waqf with crowdfunding (link strength = 28) and waqf with Islamic finance (link strength = 26). This confirms that digital waqf scholarship remains primarily anchored in fundraising innovation and financial sector integration. Notably, blockchain resides in Cluster 1, bridging the gap between decentralized fundraising (crowdfunding) and transactional integrity, whereas broader financial sector enablers (fintech, financial inclusion) reside in Cluster 2.

Table 2. Thematic Clusters of Waqf and Digitalization Research

Cluster	Cluster Label	Keywords	Core Focus & Intellectual Contribution
Cluster 1 (Red)	**Digital Waqf Mobilisation & Innovative Infrastructure**	*waqf*, *crowdfunding*, *cash waqf*, *blockchain*, *digitalization*	Focuses on operational mechanisms for asset and cash mobilization. Explores the transition from manual waqf collection to online crowdfunding platforms and evaluates blockchain for tamper-proof transaction recording and transparency.
Cluster 2 (Green)	**Islamic Fintech, Financial Inclusion & Sustainability**	*islamic finance*, *fintech*, *financial inclusion*, *sustainability*, *bibliometric analysis*	Situates waqf within the broader macro-level Islamic financial architecture. Investigates how fintech applications advance the United Nations Sustainable Development Goals (SDGs), mitigate socioeconomic marginalisation, and broaden institutional reach.
Cluster 3 (Blue)	**Islamic Social Finance Synergy**	*zakat*	Examines the convergence between waqf and zakat within integrated digital Islamic social finance platforms, highlighting joint philanthropic governance and resource distribution.

DISCUSSION

The findings of this bibliometric study provide a clear empirical mapping of how digital technologies have reshaped waqf scholarship between 2015 and 2026. By synthesizing publication trajectories, collaborative structures, citation dynamics, and keyword clusters, this section interprets the broader intellectual implications of the results, examines systemic research gaps, and highlights theoretical and practical imperatives for the digital waqf ecosystem.

Evolutionary Trajectory and the Southeast Asian Dominance Axis

The temporal distribution of publications demonstrates that scholarly interest in digital waqf has progressed from an exploratory, nascent phase (2015–2019) to an accelerated expansion phase from 2020 onward, culminating in a production peak in 2025. This trajectory reflects external macroeconomic and public health catalysts, most notably the COVID-19 pandemic. As physical collection channels and face-to-face philanthropic activities were disrupted, waqf institutions were compelled to pivot toward contactless, online financial mechanisms to sustain liquidity and maintain charitable operations.

Geographically, the field is characterized by an acute regional concentration, with Indonesia (53.5%) and Malaysia (45.5%) functioning as the twin intellectual hubs of the discipline. Their bilateral collaboration axis (14 co-authored publications) forms the core research backbone of global digital waqf inquiry. This concentration is largely explained by the domestic institutional environments of both nations:

- Regulatory and National Roadmaps: Both countries have established progressive national masterplans that explicitly integrate Islamic social finance with FinTech, such as the Indonesian Islamic Economic Masterplan (MEKSI) promoted by Bappenas and Bank Indonesia, and Malaysia's Islamic FinTech initiatives spearheaded by Bank Negara Malaysia and the Securities Commission Malaysia.
- Institutional Modernization: The presence of dedicated centralized bodies—such as the Indonesian Waqf Board (Badan Wakaf Indonesia, BWI) and the State Islamic Religious Councils (MAIN) in

Malaysia—has provided fertile ground for academic researchers to pilot, survey, and evaluate digital fundraising and cash waqf platforms.

However, this pronounced Southeast Asian clustering exposes a substantial geographic blind spot. Regions with vast historical and modern waqf assets—such as the Middle East and North Africa (MENA), South Asia, and Sub-Saharan Africa—remain markedly underrepresented in digital waqf literature. Given the structural variations in legal frameworks, regulatory autonomy, and Shariah governance across these regions, existing findings derived primarily from Southeast Asia cannot be readily generalized to differing philanthropic jurisdictions without cross-contextual validation.

Thematic Maturation: The Shift from Mobilization to Ecosystem Governance

The keyword co-occurrence analysis and citation patterns delineate a distinct technological progression across the 99 analyzed papers:

- Cluster 1: The Primacy of Digital Resource Mobilization: The strongest tie in the co-occurrence network links waqf to crowdfunding (link strength = 28) and cash waqf. This demonstrates that scholarly efforts have overwhelmingly prioritized solving the "liquidity problem" of waqf assets. Because vast tracts of endowed land remain idle due to capital shortages, crowdfunding has been embraced as a decentralized mechanism to pool micro-donations from the retail public to fund property and commercial developments.

- Cluster 2: Macro-Level Integration with Sustainable Development: High-impact studies, led by Hudaefi (2020) with 113 citations, illustrate how waqf is transitioning from an isolated religious act to an integrated pillar of the broader Islamic FinTech ecosystem aimed at financial inclusion and the UN Sustainable Development Goals (SDGs). This convergence highlights that digital platforms are valued not merely as donation portals, but as engines for poverty alleviation, SME micro-financing, and socioeconomic resilience.

- Cluster 3: Islamic Social Finance Synergy: The thematic presence of zakat alongside waqf points to an emerging interest in integrated digital social finance platforms. Linking waqf with zakat enables synchronized beneficiary registries and shared payment rails, thereby preventing redundant administrative costs across charitable sectors.

Crucially, the positioning of blockchain within Cluster 1 represents the conceptual bridge connecting resource collection with structural governance. While crowdfunding resolves capital acquisition, blockchain addresses the longstanding deficit in institutional trust, transparency, and traceability. Distributed ledger technology and smart contracts offer a cryptographic mechanism to verify donor intent, minimize agency costs, and automate revenue disbursements without intermediary leakage.

The Pre-Implementation Paradigm: Addressing the Adoption–Impact Gap

Despite the proliferation of publications, the thematic synthesis reveals a critical methodological and theoretical limitation: the literature is disproportionately concentrated on pre-implementation behavioral intention rather than post-implementation performance.

A significant volume of the analyzed corpus employs classical behavioral frameworks—chiefly the Technology Acceptance Model (TAM), Theory of Planned Behavior (TPB), and UTAUT—to survey donor willingness, perceived ease of use, and perceived usefulness (Masrizal et al., 2023; Thaker et al., 2018). While these studies provide foundational insights into the determinants of user adoption, they perpetuate several persistent blind spots:

- Intention versus Actual Behavior: High behavioral intention reported in surveys often fails to translate into sustained recurring contributions.

- Neglect of Operational Metrics: Substantially fewer empirical studies investigate the back-end impact of digital adoption on waqf institutions (nazhir / mutawalli), such as reductions in operational expenses, recovery of administrative overhead, asset yield improvements, or auditing speed.

- Absence of Beneficiary Impact Assessment: The ultimate justification for waqf is societal welfare (maslahah). Current literature remains donor-centric, with virtually no longitudinal evaluations of whether FinTech or crowdfunding platforms have measurably improved poverty reduction, educational attainment, or health outcomes among target recipients.

Artificial Intelligence: The Uncharted Research Frontier

Although terms such as artificial intelligence, machine learning, and deep learning were explicitly embedded in the search string, AI-related keywords did not achieve sufficient co-occurrence frequency to emerge as an independent cluster in the VOSviewer network. This empirical absence confirms that AI in waqf management remains at a nascent, conceptual stage.

The technological trajectory indicates that the field is poised to transition from transactional automation (FinTech and crowdfunding) and verification (blockchain) toward intelligent decision-support systems. Potential high-impact avenues for AI integration include:

- Algorithmic Beneficiary Scoring: Machine learning models capable of analyzing socioeconomic indicators to optimize needs-based fund allocation with minimal human bias.

- Predictive Cash Waqf Inflows: Predictive analytics to forecast seasonal donation trends, enhancing liquidity planning for multi-year capital projects.

- Automated Waqf Asset Valuation: Computer vision and geospatial AI to track real estate conditions, cadastral boundaries, and agricultural yields of waqf land portfolios.

Realizing these capabilities, however, introduces unprecedented governance challenges around algorithmic transparency, ethical data privacy, and Shariah compliance, demanding rigorous oversight to prevent automated marginalization of vulnerable groups.

Strategic Implications for Policy, Practice, and Shariah Governance

The findings carry direct practical implications for key stakeholders:

- For Waqf Trustees (Nazhir / Mutawalli): Institutions must move beyond treating digitalisation as a marketing façade. Investment must shift toward enterprise-grade core management systems, staff digital literacy, and data governance frameworks that safeguard donor information and comply with regional data privacy laws.

- For FinTech Developers and Islamic Banks: Developers should design interoperable platforms that unify cash waqf collection with Islamic micro-investments and sukuk issuance, providing intuitive tracking dashboards that show donors the real-time social return on their endowment.

- For Regulators and Shariah Councils: Clear regulatory sandboxes and Shariah standards are urgently needed for smart contract execution, tokenized waqf assets, and decentralized governance mechanisms. Shariah scholars and legal authorities must collaborate to define the legal enforceability of distributed digital endowments under diverse civil, common, and religious legal systems.

CONCLUSION

This study presented a comprehensive bibliometric and thematic mapping of 99 Scopus-indexed publications published between 2015 and 2026, investigating the intellectual evolution, collaborative structures, and emerging frontiers at the intersection of waqf and digital transformation. By evaluating annual scientific

production, country collaboration networks, high-impact literature, and keyword co-occurrence clusters, this review systematically tracks how technological innovations are reshaping Islamic philanthropic endowments.

The findings demonstrate that the scholarly field has transitioned from an exploratory, low-volume baseline into an era of rapid acceleration, driven significantly by the operational disruptions and digitalization demands following the COVID-19 pandemic and peaking in 2025. The discipline's geographic landscape is characterized by a high degree of regional concentration, anchored firmly along an Indonesia–Malaysia collaborative axis that accounts for the vast majority of global output. Conceptually, the intellectual structure of the domain is organized into three distinct clusters:

1. Operational resource mobilization and crowdfunding infrastructure, bridged by blockchain for transactional integrity;

2. Macro-level Islamic FinTech integration aligned with financial inclusion and the Sustainable Development Goals (SDGs); and

3. Synergistic social finance models linking waqf and zakat ecosystems.

Crucially, this analysis identifies a pronounced "adoption–impact gap" in current scholarship. While the literature has exhaustively modeled pre-implementation donor intention through behavioral frameworks such as TAM and UTAUT, empirical research evaluating post-implementation administrative efficiency, operational cost reductions, and measurable beneficiary outcomes remains scarce. Furthermore, despite widespread industry discourse on artificial intelligence, machine learning, and smart contracts, these technologies remain at an emergent, conceptual stage in the empirical waqf literature.

Limitations of the Study

The findings of this bibliometric inquiry should be interpreted in light of several methodological boundaries:

- Single-Database Scope: Data collection was restricted exclusively to Scopus. While Scopus offers broad, high-impact peer-reviewed coverage, it excludes non-indexed local journals, institutional working papers, and publications indexed solely in other databases such as Web of Science or Google Scholar.

- Linguistic and Cultural Constraints: Only English-language documents were included. This criterion inevitably introduces a linguistic filter that excludes valuable domestic scholarly output published in Arabic, Indonesian/Malay, and Turkish jurisdictions where waqf institutions possess deep historical roots and active modern revitalization programs.

- Citation Window Lag: Recent publications from 2024 to 2026 exhibit lower total citation counts compared to earlier seminal works, reflecting the natural recency effect and citation lag rather than lower academic quality or relevance.

RECOMMENDATIONS FOR FUTURE RESEARCH

To move beyond descriptive and adoption-centric models, future scholarship should prioritize the following directions:

- Longitudinal Post-Implementation Empirical Studies: Researchers should transition from measuring donor willingness to assessing the actual operational and socioeconomic impact of digital platforms on waqf management organizations (nazhir / mutawalli), using verifiable metrics such as collection costs, asset turnover, and beneficiary poverty-alleviation rates.

- Geographic Diversification and Cross-Jurisdictional Comparison: Future studies should expand beyond Southeast Asia to evaluate digital waqf adoption across the MENA region, South Asia, and Sub-

Saharan Africa, examining how varying legal traditions, institutional autonomy, and state regulations affect FinTech adoption.

- Operationalizing Artificial Intelligence and Big Data: Interdisciplinary research is needed to explore practical implementations of machine learning for automated beneficiary targeting, predictive analytics for cash waqf forecasting, and geospatial mapping for idle waqf land development.

- Shariah and Ethical Governance of Decentralized Technologies: Rigorous frameworks must be formulated to address Shariah compliance, smart contract enforceability, asset tokenization risks, and data privacy governance within digital Islamic philanthropy.

REFERENCES

1. Agaileh, Z. M. (2024). Educational waqf (endowment) in artificial intelligence programs: toward a new form of waqf. Journal of Governance and Regulation, 13(1), 231–240. https://doi.org/10.22495/jgrv13i1art21
2. Hosen, M. N., Maulana, A., Farhand, M. Z., & Fudhail Rahman, M. (2022). Evaluating the fundraising process of the world's first cash waqf-linked sukuk in Indonesia. Qudus International Journal of Islamic Studies, 10(1), 175–214. https://doi.org/10.21043/qijis.v10i1.8161
3. Hudaefi, F. A. (2020). How does Islamic fintech promote the SDGs? Qualitative evidence from Indonesia. Qualitative Research in Financial Markets, 12(4), 353–366. https://doi.org/10.1108/QRFM-05-2019-0058
4. Iman, A. H. M., & Mohammad, M. T. S. H. (2017). Waqf as a framework for entrepreneurship. Humanomics, 33(4), 419–440. https://doi.org/10.1108/H-01-2017-0015
5. Johari, M. H. Y. (2025). Artificial intelligence in Zakat and Waqf management: Enhancing fund utilisation for tourism initiatives. Journal of Islamic Accounting and Business Research, 1–17. https://doi.org/10.1108/JIABR-10-2024-0385
6. Masrizal, Sukmana, R., Trianto, B., & Zaimsyah, A. M. (2023). Determinant factor of crowdfunders' behavior in using crowdfunding waqf model in Indonesia: two competing models. Journal of Islamic Marketing, 14(7), 1793–1816. https://doi.org/10.1108/JIMA-08-2021-0246
7. Mohaiyadin, N. M. H., Aman, A., Palil, M. R., & Said, S. M. (2022). Addressing accountability and transparency challenges in waqf management using blockchain technology. Journal of Islamic Monetary Economics and Finance, 8, 53–80. https://doi.org/10.21098/jimf.v8i0.1413
8. Mohd Thas Thaker, M. A. B. (2018). A qualitative inquiry into cash waqf model as a source of financing for micro enterprises. ISRA International Journal of Islamic Finance, 10(1), 19–35. https://doi.org/10.1108/IJIF-07-2017-0013
9. Mohd Thas Thaker, M. A. B., & Allah Pitchay, A. (2018). Developing waqf land through crowdfunding-waqf model (CWM): the case of Malaysia. Journal of Islamic Accounting and Business Research, 9(3), 448–456. https://doi.org/10.1108/JIABR-05-2016-0062
10. Mohd Thas Thaker, M. A., Mohd Thas Thaker, H., & Allah Pitchay, A. (2018). Modelling crowdfunders' behavioral intention to adopt the crowdfunding-waqf model (CWM) in Malaysia: The theory of the technology acceptance model. International Journal of Islamic and Middle Eastern Finance and Management, 11(2), 231–249. https://doi.org/10.1108/IMEFM-06-2017-0157
11. Piliyanti, I., Latief, H., & Anwar, S. (2022). Technologizing Islamic Philanthropy During The Covid-19 Pandemic in Indonesia. Journal of Muslim Philanthropy and Civil Society, 6(2), 120–141. https://www.scopus.com/pages/publications/85147011593?origin=resultslist
12. Syarifuddin, F. (2024). Productive WAQF business models through the integration of Islamic social and commercial finance. Edelweiss Applied Science and Technology, 8(4), 620–655. https://doi.org/10.55214/25768484.v8i4.1440
13. Van Eck, N. J., & Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. Scientometrics, 84(2), 523–538. https://doi.org/10.1007/s11192-009-0146-3