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Developing Digital Islamic Social Finance Models for Micro Small Enterprises During Crisis in Indonesia

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Abstract

This study proposes and empirically evaluates a crisis-responsive digital Islamic Social Finance (ISF) model for supporting micro and small enterprises (MSEs) in Indonesia. Employing the Analytic Network Process (ANP), the research examines the interdependent relationships among four key dimensions: compliance, MSE requirements, infrastructure, and ISF purpose, alongside alternative digital ISF models integrating zakat, sadaqah, and waqf. Primary data were obtained through expert-based Focus Group Discussions and ANP questionnaires involving representatives from regulators, Islamic social finance institutions, fintech practitioners, and academia. The results demonstrate that infrastructure is the most influential criterion (0.64), reflecting the centrality of digital governance, system integration, and institutional readiness. MSE requirements (0.444) emerge as the second priority, followed by compliance (0.264) and ISF purpose (0.212). At the model level, a waqf-based digital ISF framework ranks highest in promoting long-term MSE empowerment, while zakat and sadaqah-based models function as short-term stabilizers during crisis conditions. The findings confirm that an integrated and layered digital ISF architecture enhances economic resilience by aligning institutional capacity, beneficiary needs, and maqasid al-shariah–oriented objectives. This study offers policy-relevant insights for strengthening inclusive and sustainable economic recovery through digital Islamic social finance.

Keyword: Waqf, Digital Islamic Social Finance, Analytic Network Process, Waqf Digitization, Micro and Small Enterprises, Economic Crisis

Background

The crisis that Indonesia is experiencing is multi-faceted, encompassing economic, social and political dimensions. Indonesia has faced various crises, including the 1997-1998 economic crisis and the recent COVID-19 pandemic crisis (Yuda, 2023). The 1998 financial crisis had a significant impact on Indonesia, leading to widespread inflation and economic disruption (Orman, 2018). The crisis caused the stock market index to drop by more than 35%,

indicating a severe financial downturn (Indrayono, 2021). The crisis led to a depreciation of the rupiah against the US dollar by more than 200%, which had a detrimental impact on MSEs (Tambunan, 2020). The role of micro and small enterprises (MSEs) in the Indonesian economy is significant and diverse. MSEs are critical to economic growth, job creation, and overall business sustainability in Indonesia. MSEs contribute greatly to the economy, with MSEs accounting for 99.9% of total businesses, 60.51% of GDP, and providing 96.92% of employment in Indonesia (Gunadi et al., 2021). The following is data for Micro, Small, Medium, and Corporate Businesses.

Table 1
Micro, Small, Medium, and Corporate Enterprise Data

Business Unit	Number		Workers	Export
Micro	64.601.352	98,67%	89,04%	1,40%
Small	798.679	1,22%	4,81%	2,60%
Medium	65.465	0,10%	3,07%	11,65%
Large	5.637	0,01%	3,08%	84,35%
MSME+L	65.471.134	100%	100%	100%

(Source: (kemenkopukm.go.id, 2021)

The impact of the 1998, 2008, 2018 and COVID-19 crises on micro and small enterprises in Indonesia has been profound. The COVID-19 pandemic has had a significant impact on companies around the world, including Indonesia, causing a decline in production, revenue and labor (Gunadi et al., 2021). The pandemic has hit the Indonesian economy hard, especially impacting Micro, Small and Medium Enterprises (MSMEs) (Nugroho et al., 2022). In addition, the pandemic has caused a decrease in sales turnover for micro and small entrepreneurs (Liguori & Pittz, 2020). The economic impact of the COVID-19 pandemic is expected to worsen for small businesses and their employees before economic conditions improve (Hakim, 2021). In addition, the pandemic also impacts the long-term viability of MSMEs in terms of financing, production, distribution, and market demand (Tambunan, 2020). The following is data on MSME growth from before the pandemic crisis to after the pandemic.

Table 2
MSMEs Growth Data

Year	2018	2019	2020	2021	2022	2023
MSMEs (Millon)	64,19	65,47	64	65,44	65	66
Growth		1,98%	-2,24%	2,28%	-0,70%	1,52%

(Source: Indonesian Chamber of Commerce and Industry, 2024)

The growth of Micro, Small, and Medium Enterprises (UMKM) in Indonesia from 2018 to 2023 shows a fluctuating but overall positive trend. The number of UMKM increased from 64.19 million in 2018 to 65.47 million in 2019, growing by 1.98%, before declining to 64 million in 2020 as a direct impact of the COVID-19 crisis, which severely disrupted business activities. Although the sector rebounded in 2021 to 65.44 million with a growth rate of 2.28%, the lingering effects of the COVID-19 crisis continued into 2022, resulting in a slight contraction to 65 million (−0.70%) due to weakened demand, supply chain disruptions, and limited business recovery. In 2023, UMKM growth strengthened again, reaching 66 million units with

a growth rate of 1.52%, indicating a gradual post-crisis recovery and reaffirming the resilience of UMKM in Indonesia's economy. According to the Secretary of the Minister of Cooperatives and MSMEs, the COVID-19 pandemic has affected the business activities of 90% of MSMEs (Limanseto, 2021). Small and medium entrepreneurs cannot survive due to disruptions including supply, decreased demand, decreased sales, profits, and unpreparedness in overcoming the COVID-19 pandemic outbreak (Sha et al., 2020).

Digital transformation is an important aspect for the sustainability and growth of micro and small enterprises, especially in the context of the COVID-19 pandemic (Abbas et al., 2024). The Indonesian government's initiative towards a digital economy underscores the importance of technology adoption by micro and small enterprises (Riswandi & Permadi, 2022). The integration of digital technologies can improve efficiency, customer experience, and decision-making processes, thus empowering these businesses to remain competitive and meet evolving consumer demands (Sukrat, 2023). In addition, the COVID-19 pandemic has accelerated digital transformation in Indonesian MSMEs, highlighting the need for rapid adaptation to digital tools and platforms (Legowo & Sorongan, 2022). The following is data Number of MSMEs joining the Digital ecosystem.

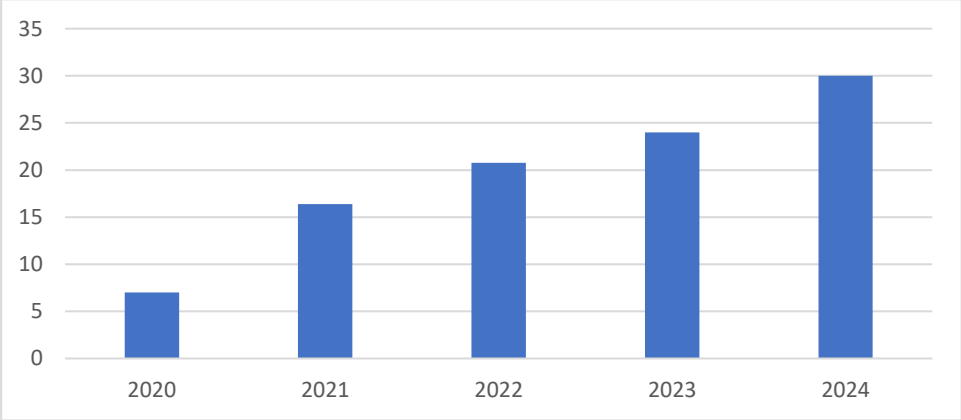

Figure 1. Number of MSMEs joining the Digital ecosystem (million)
(source: (Indonesian Chamber of Commerce and Industry, 2024)

The table illustrates a strong and consistent increase in the number of MSMEs joining the digital ecosystem in Indonesia from 2020 to 2024. In 2020, approximately 7 million MSMEs had adopted digital platforms, reflecting the early stage of digital transformation, largely driven by the need to survive during the COVID-19 crisis. This number rose sharply to around 16 million in 2021, indicating accelerated digital adoption as businesses adjusted to mobility restrictions and shifts in consumer behavior. The upward trend continued in 2022 and 2023, reaching about 21 million and 24 million MSMEs, respectively, supported by government programs, private sector initiatives, and expanding digital infrastructure. By 2024, the number increased significantly to approximately 30 million MSMEs, highlighting the growing integration of digital technologies into business operations and underscoring the role of digitalization as a key driver of resilience and competitiveness for MSMEs in Indonesia (Indonesian Chamber of Commerce and Industry, 2024).

Research shows that digital transformation is critical for companies of all sizes in today's market landscape (Liu, 2022). Within the framework of Industry 4.0, digitalization has

transformed the operations of MSMEs, enabling them to achieve economic independence and sustainability (Dewi et al., 2023; Abbas et al., 20242b). Factors influencing the digital transformation process of MSMEs include both internal and external elements, with the COVID-19 pandemic serving as a significant external driver for digitalization (Wiliandri, 2020). Islamic Social Finance (ISF) is one of the instruments in the Islamic financial ecosystem (Jouti, 2019). According to the Islamic Research and Training Institute (IRTI) (2020), ISF inclusively includes traditional Islamic instruments based on philanthropy (such as Zakat, Shadaqat, and Waqf) and cooperation (such as Qard and Kafala). It is not limited to just traditional instruments, but also includes modern forms of Islamic financial services such as Islamic microfinance, Sukuk, and takaful that are established to address community challenges.

Islamic social finance (ISF) has emerged as a significant tool in supporting Micro and Small Enterprises (MSEs) in various countries. Research shows that the successful adoption of ISF can lead to poverty alleviation, accelerate MSE development, and improve equitable welfare (Ascarya, 2021). Specific models such as cash waqf funds have been proposed as a viable alternative for financing microenterprises, demonstrating the potential of ISF in supporting MSEs (Thaker et al., 2016). Factors such as firm characteristics, owner-manager Islamic finance knowledge, and capital structure decisions significantly influence the adoption of Islamic finance in small firms (Balushi et al., 2019). During crises such as the COVID-19 pandemic, ISF has played an important role in stabilizing the income of micro-entrepreneurs, highlighting its significance in supporting MSEs during difficult times (Azman et al., 2021). In addition, a mosque-based sustainable financing model utilizing cash waqf has been proposed to provide financial assistance to microenterprises, further underlining the potential of ISF in supporting MSEs (Imtiyaz et al., 2022).

Digitalization in Islamic finance is a growing field that shows significant potential for the future of Islamic financial services. The integration of digital technology in Islamic finance, often referred to as Islamic FinTech, is considered essential to achieve financial inclusion, social justice and equitable distribution of wealth in society (Khan et al., 2022). Research shows that Islamic fintech requires a strong legal framework to foster industry development, promote digital economic growth, and mitigate legal risks such as financial crime and terrorism financing (Muryanto et al., 2021).

Regarding sharia fintech in Indonesia, there are currently seven sharia fintech companies registered with the Financial Services Authority (Anwar et al., 2022) and for crowdfunding companies have 15 companies (ksei, 2023). Islamic fintech services in Indonesia include peer-to-peer lending, payment instruments, and crowdfunding (Trimulato et al., 2022). These Islamic fintech platforms provide ease of transactions, especially for the Muslim community (Sari, 2023). Collaboration with fintech is expected to increase the role of Sharia-based loans and other Sharia fintech services, thus contributing to the development of the halal product industry in Indonesia (I. S. Dewi & Adinugraha, 2023).

The integration of financial technology (fintech) into the Islamic social finance model, particularly in the context of zakat, infaq, and waqf, has gained significant traction in Indonesia. This development is largely driven by the need for enhanced financial inclusion and the efficient management of social funds. The emergence of fintech has provided Islamic financial institutions (IFIs) with innovative tools to streamline operations and broaden their

outreach to underserved populations, thereby facilitating the collection and distribution of zakat, infaq, and waqf funds. Fintech has been identified as a transformative force within the Islamic finance sector, particularly in Indonesia, where it has the potential to enhance the efficiency of zakat collection through crowdfunding platforms. Ascarya highlights that fintech can attract external investors to Islamic microfinance institutions (IMFIs), which can subsequently channel these funds into social finance initiatives, including zakat and waqf (Ascarya, 2021). This is echoed by Supriadi, who notes that the rapid growth of Islamic fintech has significantly improved financial accessibility and empowered micro, small, and medium enterprises (MSMEs) in Indonesia (Supriadi, 2023). The ability of fintech to reduce operational costs and improve outreach is crucial for enhancing the effectiveness of zakat and waqf management (Ascarya & Sakti, 2022a).

Despite the growing body of literature highlighting the roles of Islamic Social Finance (ISF) instruments and digital transformation in supporting micro and small enterprises (MSEs), existing studies largely address these dimensions separately and provide limited insight into how integrated digital ISF models can effectively respond to crisis conditions. In particular, empirical research that systematically captures the interdependencies among sharia compliance, MSE requirements, digital infrastructure, and maqasid-oriented ISF objectives remains scarce, especially within the Indonesian context. Moreover, there is a lack of structured decision-making frameworks that prioritize alternative digital ISF models zakat, sadaqah, and waqf based on their short-term stabilizing and long-term empowerment roles during economic crises. Addressing this gap, the present study aims to develop and evaluate a crisis-responsive digital Islamic Social Finance model for MSEs in Indonesia by employing the Analytic Network Process (ANP) to analyze interrelated dimensions and prioritize integrated digital ISF alternatives, thereby offering policy-relevant insights for strengthening economic resilience and sustainable recovery in times of crisis.

Literature Review

Concept of Islamic Social Finance (ISF)

Islamic Social Finance (ISF) is a crucial component of the broader Islamic financial system, designed to promote socio-economic empowerment through instruments such as zakat, infaq, waqf, and Islamic microfinance (Kuanova, 2021); (Jouti, 2019). Research has shown that ISF can contribute significantly to poverty alleviation and economic recovery by providing a much-needed financial safety net during times of crisis (Ascarya, 2021). According to Ascarya & Sakti (2022), the flow of Islamic Social Finance involves a systematic approach to mobilizing and distributing funds, ensuring that resources reach those most in need. This process enhances financial resilience, particularly for underserved communities, while simultaneously promoting long-term economic empowerment. As such, ISF stands as a dynamic instrument that not only addresses immediate economic challenges but also supports the broader goals of social justice and economic equity, which are integral to the principles of Islamic economics. The following is the flow of the ISF according to Ascarya and Sakti (2022):

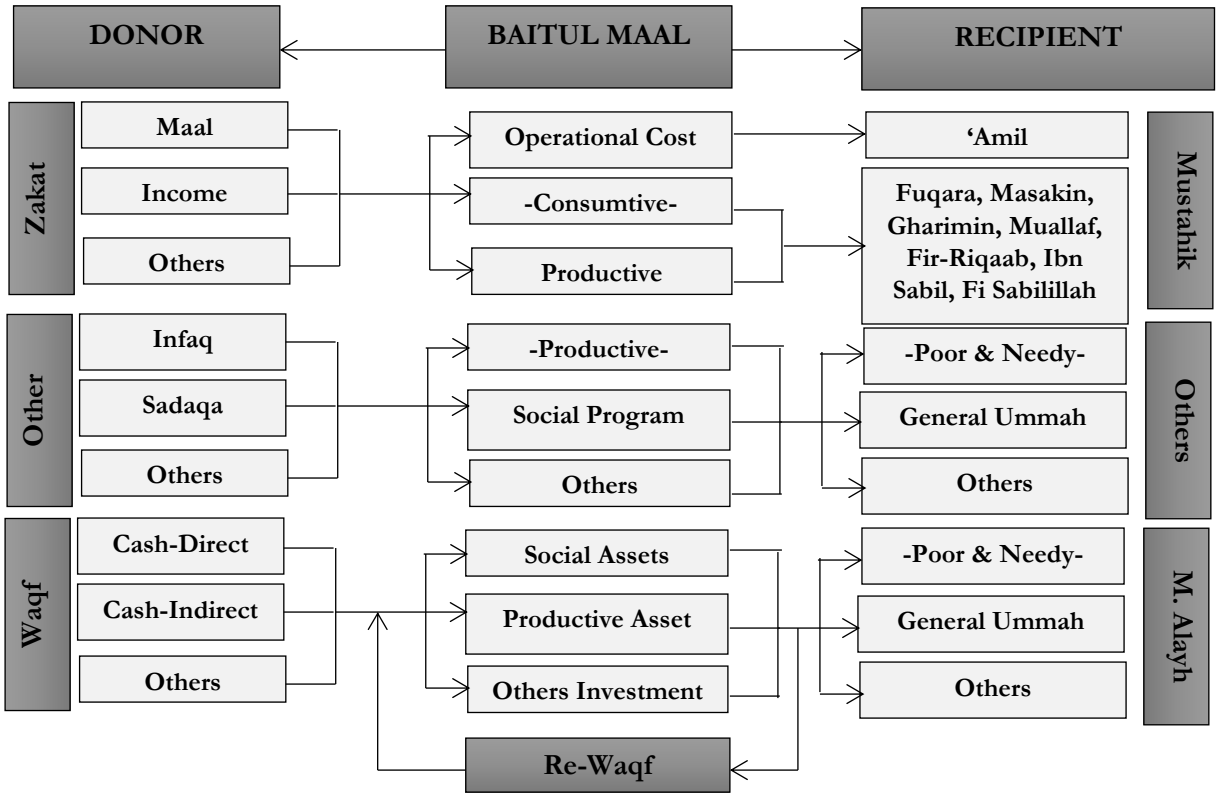

Figure 2. Islamic Social Finance Model
(Source: (Ascarya & Sakti, 2022a)

Financial Technology (Digital Base)

Based on Bank Indonesia Regulation (PBI) No. 19/12/PBI/2017 on the Implementation of Financial Technology, fintech providers in Indonesia are classified into five categories: payment systems, market support services, investment and risk management, lending and financing, and other financial services. In parallel, social-based crowdfunding activities are regulated under Law No. 9 of 1961 concerning the Collection of Money and Goods and require formal authorization from relevant institutions, including an official permit or decree from the National Amil Zakat Agency (BAZNAS) and approval from the Indonesian Waqf Board (BWI). Furthermore, electronic-based crowdfunding platforms must obtain additional licensing from the Ministry of Communication and Information (KEMENKOMINFO). Well-established platforms such as Kitabisa.com, BenihBaik.com, and WeCare.id exemplify compliant social crowdfunding models operating within this regulatory framework (Hidayati, 2024).

Criteria that Determine the Digital-Based Islamic Social Finance Model

The development of a digital-based Islamic social finance model is influenced by various criteria that ensure its effectiveness and alignment with Islamic principles. (Ascarya & Sakti, 2022a) outline several key determinants that are essential for establishing such a model, which can be further explored through the lens of contemporary research in Islamic finance.

Compliance

To ensure adherence to Islamic Social Finance (ISF) principles, several interrelated sub-characteristics must be embedded within the ISF model. First, Sharia compliance is

fundamental, requiring all financial activities to strictly avoid prohibited elements such as *riba* (interest) and *gharar* (excessive uncertainty), thereby safeguarding the integrity of Islamic finance and strengthening stakeholder trust (Mustika, 2021). Second, regulatory strengthening plays a critical role in ensuring that ISF institutions operate in accordance with both Shariah principles and national legal frameworks, which enhances institutional credibility and provides legal protection for all stakeholders (Widiastuti et al., 2022a). Third, the incorporation of social law is essential to promote equity and justice, particularly by ensuring inclusive access to financial services and fair distribution of benefits to marginalized communities, in line with Qur'anic teachings emphasizing social responsibility and fairness, as reflected in Surah an-Nahl (90) (Notolegowo, 2023). Finally, stakeholder policy underscores the importance of participatory governance, where community members, beneficiaries, and relevant actors are actively engaged in decision-making processes, thereby enhancing transparency, accountability, and the overall effectiveness of ISF initiatives (Sairally, 2013a).

MSEs' Needs During a Pandemic

Micro and small enterprises (MSEs) require adaptive financial support mechanisms to address liquidity constraints and operational disruptions experienced during crisis periods. Convenience and flexibility in lending are critical, as declining revenues and rising costs necessitate streamlined financing schemes with minimal bureaucratic barriers, enabling rapid access to funds and sustained cash flow (Perdana et al., 2020). Beyond financing, business mentoring plays a pivotal role in strengthening MSE resilience by providing strategic guidance on business model adaptation, digitalization, and market repositioning, which enhances competitiveness under volatile conditions (Pongtanalert & Assarut, 2022). Moreover, simplified loan application processes, particularly through digital platforms, reduce informational and procedural constraints, thereby improving accessibility and aligning with accelerated digital transformation trends (Kimuli et al., 2021). Flexible loan repayment terms, including deferred payments and extended tenures, are equally essential in mitigating financial pressure amid economic uncertainty (Peter, 2024). Finally, accommodating alternative collateral arrangements, such as cash flow–based or unsecured financing, can lower entry barriers for MSEs and expand inclusive access to capital during crisis conditions (Dejardin et al., 2022).

Infrastructure

Infrastructure plays a pivotal role in enhancing financial inclusion within Islamic Social Finance (ISF) institutions, particularly for micro and small enterprises (MSEs) in Indonesia's rapidly evolving digital landscape. The development of robust digital infrastructure enables ease of access through user-friendly platforms that simplify zakat collection and distribution, provide real-time transaction updates, and increase MSE participation in ISF programs (Priyana, 2024). At the same time, transparent digital reporting systems—such as dashboards displaying fund allocation, utilization, and impact—are essential for building trust and accountability, ensuring that zakat funds are managed ethically and effectively (Widiastuti et al., 2022). A strong digital presence also enhances the institutional image of ISF organizations by improving visibility, promoting success stories, and demonstrating tangible socio-economic impacts, which can attract greater engagement from MSEs (Aam & As-Salafiyah, 2021). Furthermore, digital infrastructure facilitates institutional networking by connecting ISF institutions, MSEs, and other stakeholders, fostering collaboration, knowledge sharing,

and innovative partnerships that collectively improve the efficiency, sustainability, and developmental impact of ISF initiatives (Widiastuti et al., 2022b).

Purpose of ISF

The purpose of Islamic Social Finance (ISF) is to address both the financial and social needs of micro and small enterprises (MSEs), particularly amid contemporary challenges such as the COVID-19 pandemic, through a holistic and Shariah-compliant approach. ISF provides alternative financial solutions for MSEs that are often excluded from conventional financing due to limited collateral or credit history, notably through Islamic crowdfunding instruments based on profit-sharing schemes such as *mudharabah* and *musharakah*, which enhance financial inclusion without imposing interest-based burdens (Ashari, 2023). During crisis periods, ISF also offers critical business solutions by supporting MSE adaptability through access to digital tools, business mentoring, and knowledge-sharing networks, thereby strengthening enterprise resilience and sustainability (Moidin et al., 2023). Beyond enterprise support, ISF plays a fundamental role in advancing social welfare by channeling funds into socially responsible activities, particularly through zakat as a mechanism for wealth redistribution that promotes equity, community solidarity, and poverty alleviation. Ultimately, by empowering MSEs, fostering ethical business practices, and stimulating local economic activity, ISF contributes to improved economic welfare, job creation, and sustainable economic development aligned with Islamic values (Ashari, 2024).

Islamic Social Finance Model on Financial Technologi

The integration of Islamic social finance (ISF) with financial technology (fintech) represents a transformative development in financial services, particularly in Muslim-majority countries, by enhancing the effectiveness of Shariah-compliant instruments such as zakah, waqf, and qard hasan in addressing social and economic challenges (Aam & As-Salafiyah, 2021). Fintech applications significantly improve efficiency, accessibility, and financial inclusion by digitalizing the collection and distribution of Islamic social funds, thereby strengthening social empowerment and outreach (Yulianto, 2024). Technologies such as blockchain contribute to greater transparency and accountability in zakah and waqf management, ensuring that funds are securely allocated to intended beneficiaries and reinforcing trust in line with Islamic ethical principles (Franzoni & Allali, 2018). In addition, Islamic crowdfunding platforms enable broader community participation and resource mobilization to address local social issues in a more inclusive and participatory manner (Khan, 2023). By leveraging fintech, ISF also strengthens its alignment with the Sustainable Development Goals (SDGs), particularly poverty alleviation and reduction of inequality, as digital platforms expand the scale, impact, and effectiveness of social finance initiatives while promoting greater public awareness and integration of Islamic finance within the wider financial system (Widiastuti et al., 2022).

An Integration Model Between Zakat and Fintech Model

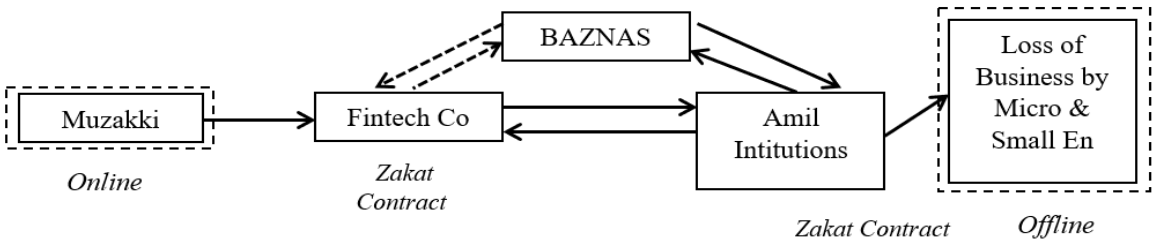

Figure 3. Integration zakat dan crowndfunding model
((Sonial Manara et al., 2018)(Syed et al., 2020), Modifed by Author)

The zakat distribution process through fintech platforms involves muzaki registering and paying zakat digitally, after which the collected funds are transferred to BAZNAS for recording and verification. BAZNAS, often in collaboration with LAZs that possess local networks, identifies and verifies eligible mustahiqs, while LAZs manage and distribute the zakat either through direct assistance or empowerment programs. Throughout this process, fintech platforms support transparency and accountability by enabling reporting on fund utilization and collecting feedback from mustahiqs, thereby creating a more efficient and impactful zakat ecosystem for poverty alleviation (Sonial Manara et al., 2018; Syed et al., 2020).

An Integration Model Between Infaq and Fintech Model

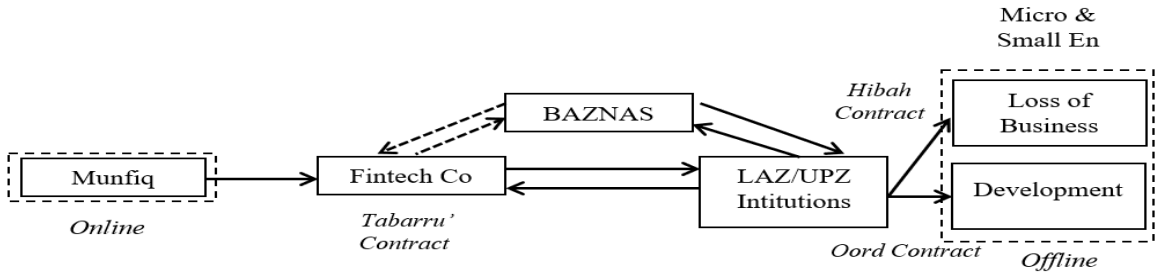

Figure 4. Integration Infaq dan crowndfunding model
(Source: (Muhammad Amir Lutfi & Mohd Adib Ismail, 2016), Modifed by Author)

The diagram presents an Islamic fintech-based financial model that integrates zakat institutions to support micro and small enterprises (MSEs) through a hybrid online–offline system grounded in Shariah principles. In this model, munfiq (donors) contribute funds voluntarily via fintech platforms under a *tabarru'* contract, which are then channeled to BAZNAS and LAZ/UPZ institutions. BAZNAS acts as the regulator and supervisor to ensure proper governance and Shariah compliance, while LAZ/UPZ institutions serve as implementers that distribute funds directly to MSEs using *hibah* (grants) for loss recovery and *qard* (benevolent loans) for business development. The integration of fintech with traditional zakat institutions enhances transparency, efficiency, and accessibility, ensuring financial inclusion and sustainable support for MSEs. Overall, this model demonstrates an innovative, Shariah-compliant approach that bridges donors, institutions, and micro-entrepreneurs, promoting economic empowerment and social welfare through Islamic social finance.

An Integration Model between Waqf and Fintech Model

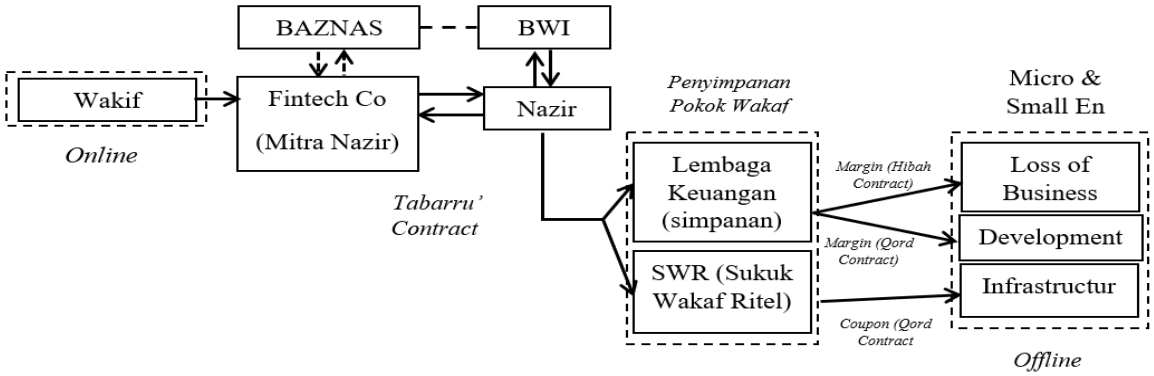

Figure 5. Integration Waqf and crowdfunding model
(Source: (Nuriyah & Fakhri, 2022); (Azganin et al., 2021); Modifed by Author)

The diagram illustrates an Islamic fintech–based waqf investment model designed to support micro and small enterprises (MSEs) through a structured, Shariah-compliant financial ecosystem. In this model, wakif contribute waqf funds digitally via a fintech platform acting as a *mitra nazir* under a *tabarru'* contract, with governance and oversight provided by BWI as the waqf authority and coordination with BAZNAS for broader Islamic social finance integration. The collected waqf funds are managed by nazir and allocated through financial institutions for the preservation of waqf principal and through *Sukuk Wakaf Ritel* (SWR) to generate sustainable returns. These returns are then distributed to MSEs using Islamic contractual mechanisms, including *hibah* for loss recovery, *qard hasan* for business development, and coupon-based *qard* for infrastructure financing. By integrating digital fintech platforms with traditional waqf management and Shariah-compliant investment instruments, this hybrid model enhances transparency, efficiency, and capital sustainability, while promoting financial inclusion, business resilience, and socio-economic welfare within an Islamic economic framework.

Conceptual Framework

The conceptual framework and ANP model in the super decision for the suitability of the digital-based ISF model can be described below the results of discussions with experts:

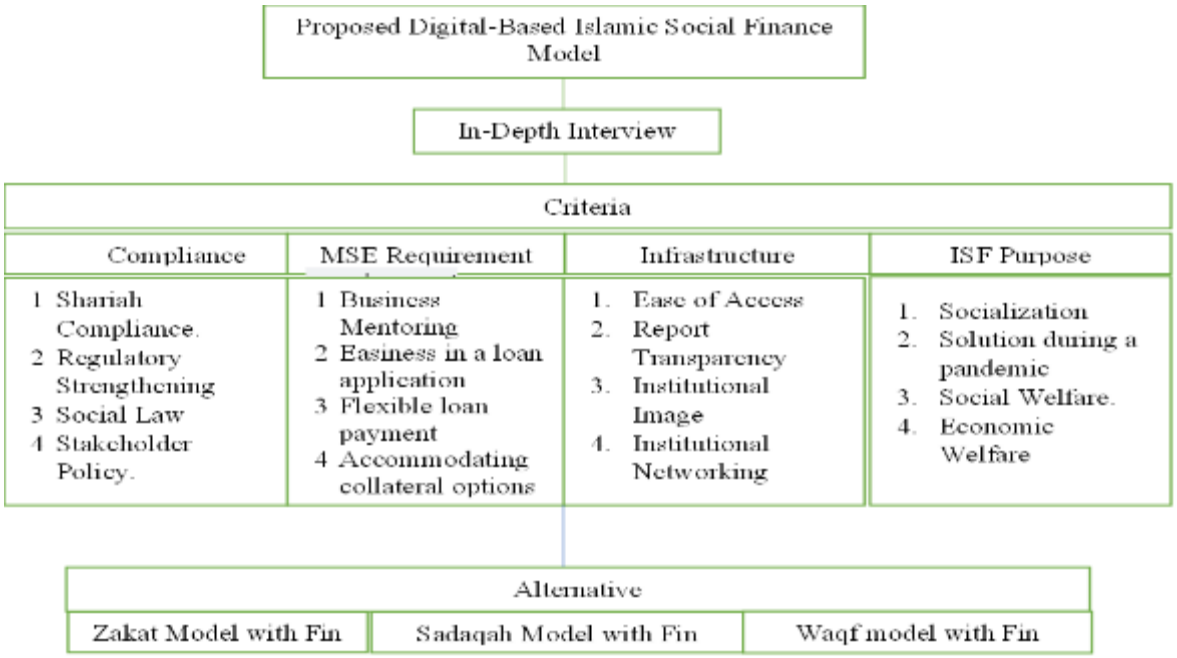

Figure 6. Recommendation of Model Concept *ISF*

Methodology

This chapter presents the research methodology, employing the Analytic Network Process (ANP) as the main framework to analyze interdependencies among criteria and alternatives. The process involves problem structuring through the identification of key elements into clusters and nodes, followed by expert selection comprising academics, practitioners, and domain specialists to ensure reliable pairwise comparisons.

Data

This study employs a mixed qualitative–quantitative approach to capture expert and practitioner perspectives on the suitability of a digital-based Islamic Social Finance (ISF) model in Indonesia. Accordingly, in-depth interviews and the Analytic Network Process (ANP) are adopted as the main methodologies. Data collection is conducted in two stages: the first involves in-depth interviews with five key informants ISF experts, regulators, Fintech expert and academics/MSME advisors to validate the criteria and structure of the ANP framework based on prior studies. The second stage applies an ANP-based interview protocol using ratio-scale pairwise comparisons, administered individually to selected experts. Consistent with prior studies, the number of experts involved ranges from 5 to 15, which is considered sufficient for ANP analysis, with respondents comprising experts and practitioners who have strong knowledge of ISF model implementation (Khorramshahgol & Moustakis, 1988; Lin et al., 2009).

Table 3
Experts and Practitioner Respondents (ANP)

Respondents		
No	**Name**	**Position**
1	RI	Economic Researcher Specialist (Deputy Director), Central Bank of Indonesia (Regulator)
2.	HT	Center for Digital Research and Transformation of the Indonesian Waqf Board (ISF Expert)
3	AAYS	Head of Innovation and Creative Program Division, BAZNAS (ISF Expert)
4	RYW	Chairperson, Indonesia Sharia Fintech Association (Fintech Expert)
5.	YTS	MSME Advisor at Asy-Syirkah Cooperative /Vice Rector For Academic Affairs in IAI TAZKIA (MSME Expert/Academics)

Data Analysis

According to (Ascarya, 2005), the Analytic Network Process (ANP) has three main functions: structuring complex problems into homogeneous clusters, using ratio-scale measurements to reflect relative importance, and synthesizing multiple dimensions into a unified decision outcome. After data are compiled into an ANP framework and questionnaire responses are collected, the analysis is conducted using ANP through pairwise comparisons among criteria and alternatives. Unlike the hierarchical structure of AHP, ANP applies a network structure in which elements are grouped into clusters consisting of interconnected nodes, allowing for interdependencies among criteria and alternatives to be systematically analyzed.

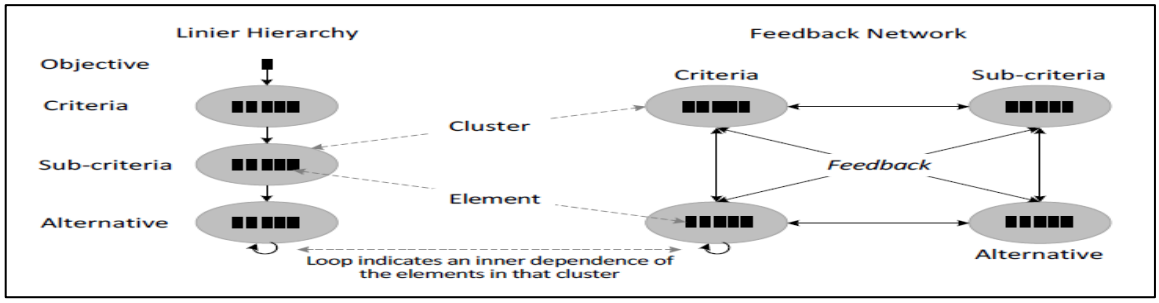

Figure 7. Comparison of Linear Hierarchies and Feedback Networks
(Source: Saaty & Vargas, 2013)

In ANP, feedback allows alternatives to depend not only on criteria but also on other alternatives, while criteria themselves may depend on alternatives or fellow criteria. This feedback mechanism enhances priority accuracy and makes ANP results more stable (Ascarya, 2005). Dependencies can occur across different clusters (outer dependence) or within the same cluster, forming loop relationships known as inner dependence. The objective of ANP is to determine the overall effect of each element by arranging criteria within a network framework, conducting pairwise comparisons, and synthesizing priorities. These priorities are then weighted by the importance of each criterion to obtain a comprehensive evaluation. The strength of ANP lies in its use of ratio-scale measurements, which capture complex interactions and enable accurate predictions. ANP is grounded in key axioms, including reciprocity—where comparative judgments are inverse—and homogeneity, which requires that compared elements remain reasonably similar to ensure reliable judgments using a 1–9 numerical scale (Ascarya, 2005).

Tabel 4
ANP Scales

Definition	Intensity of importance	Explanation
(extreme importance)	9	The evidence favoring one activity over another is of the highest possible order of affirmation
For compromises between the above values	8	
(Very Strong and Demonstrated Importance)	7	An activity is favored very strongly over another, its dominance demonstrated in practice
For compromises between the above values	6	
(Strong Importance)	5	Experience and judgment strongly favor one activity over another
For compromises between the above values	4	
(Moderate Importance)	3	Experience and judgment slightly favor one activity over another
For compromises between the above values	2	Two activities contribute equally to the objective
(Equal Importance)	1	

Source: (Saaty & Özdemir, 2005)

ANP Process

The Analytic Network Process (ANP) is employed to address complex problems through a mathematical framework capable of analyzing the influence of interacting and interdependent elements (Zam et al., 2020). By incorporating network feedback, ANP allows elements to be mutually dependent rather than strictly hierarchical, making it suitable for applications such as decision making, evaluation, forecasting, mapping, strategy formulation, and resource allocation (Saaty, 2005; Saaty & Vargas, 2006). To complement ANP, the Delphi method is used to manage complexity by structuring expert communication and facilitating consensus among individuals with specialized knowledge, particularly when judgments are subjective and participants are geographically dispersed (Rikkonen et al., 2006; Brill et al., 2006; Grisham, 2009). Accordingly, this study adopts the Delphi–ANP approach, with research stages following the framework proposed by Ascarya (2014).

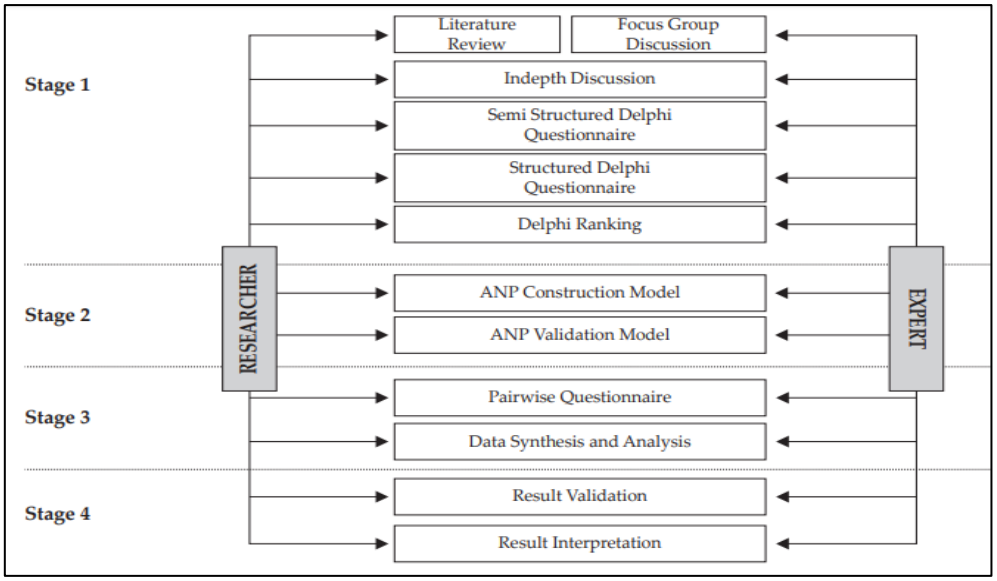

Figure 8. ANP Research Stage

Result and Discussion

This section presents the results of the Analytic Network Process (ANP) analysis, which aims to identify the relative importance of key clusters in developing a digital-based Islamic Social Finance (ISF) model for micro and small enterprises. Understanding these priorities is essential for formulating policy and implementation strategies that are both contextually relevant and Shariah-compliant.

Structure Modeling using the ANP Model

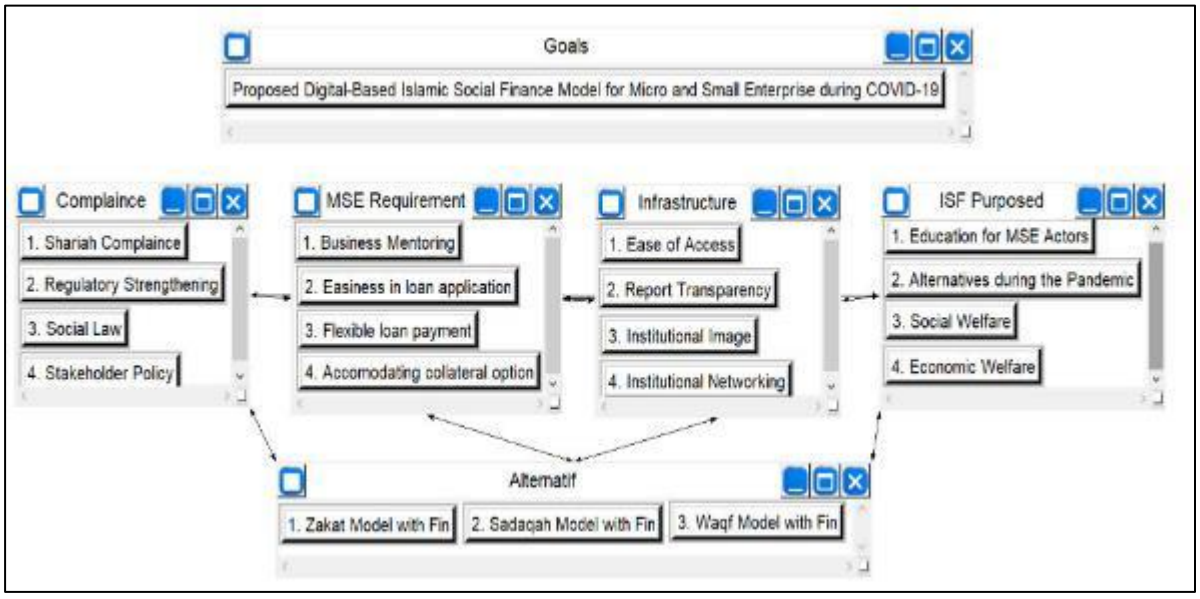

Figure 9. Structure Modeling using the ANP Model
Source: ANP Model

The ANP model in this study is structured to identify the most appropriate digital-based Islamic Social Finance (ISF) model for supporting micro and small enterprises (MSEs) during crisis periods. The research goal is the development of a sustainable ISF–fintech integration model, supported by four key clusters: compliance, MSE requirements, infrastructure, and ISF purposes. The compliance cluster addresses Shariah adherence, regulatory strengthening, social law, and stakeholder policy; the MSE requirements cluster captures practical business needs such as mentoring, ease of financing access, flexible repayment, and collateral accommodation; the infrastructure cluster focuses on accessibility, reporting transparency, institutional image, and networking; while the ISF purpose cluster reflects broader objectives including socialization, crisis solutions, and social and economic welfare. These clusters are interrelated, highlighting ANP's ability to capture interdependencies rather than a simple hierarchical structure. At the final stage, the model evaluates three ISF fintech alternatives zakat, infaq (sadaqah), and waqf using pairwise comparisons and supermatrix analysis to determine the most effective and contextually relevant model for enhancing MSE resilience during crises.

Result of Criteria

Table 5

Criteria Result

Klaster	weight	Rank
Infrastructure	0,64	1
MSE Requirement	0,444	2
Compliance	0,264	3
ISF Purpose	0,212	4

(Sourch: ANP, 2024)

The clustering results show that Infrastructure is the most dominant factor (weight = 0.64), underscoring its role as the core enabler of the system, as effective digital systems, institutional arrangements, governance, and human resources largely determine implementation success and sustainability. The MSE Requirement cluster ranks second (weight = 0.444), highlighting the importance of aligning the model with the practical needs of micro and small enterprises so that available infrastructure translates into real economic impact. Compliance follows in third place (weight = 0.264), functioning primarily as an institutional safeguard that ensures Shariah and regulatory legitimacy while reinforcing system credibility rather than directly driving performance. Lastly, ISF Purpose has the lowest weight (0.212), indicating that normative objectives such as social welfare and justice act as long-term guiding principles whose realization depends on strong infrastructure, responsive MSE-oriented mechanisms, and consistent compliance. Together, these clusters form a coherent structure in which infrastructure provides the foundation, MSE requirements ensure relevance, compliance maintains integrity, and ISF purpose defines the system's ultimate direction.

Sub Criteria

The Infrastructure Sub-Criteria

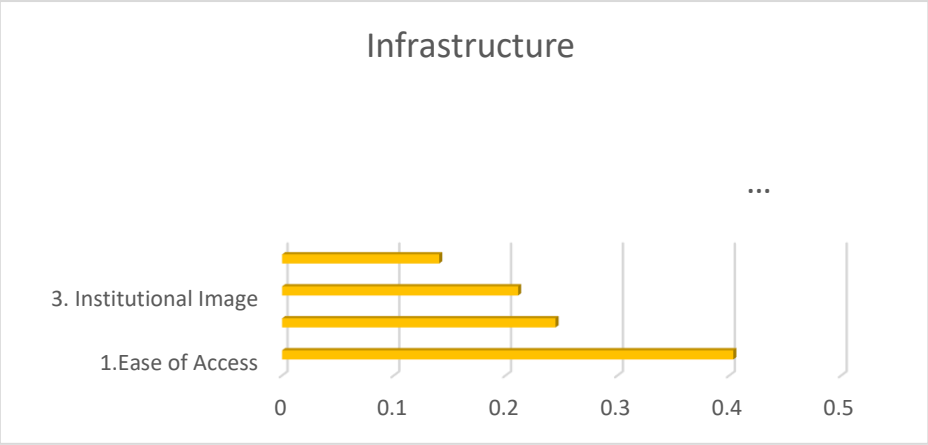

Figure 10. The Geometric Mean Results from Infrastructure
(source: processed data, 2024)

Building upon the individual expert perspectives, the geometric mean results derived from the ANP framework reveal a clear hierarchy of infrastructure priorities within the Islamic digital finance ecosystem. Ease of Access emerges as the most dominant sub-criterion

(geomean = 0.4035), indicating that, despite differing expert emphases, collective judgment converges on accessibility as the foundational enabler of system adoption and user participation. This finding suggests that regulatory robustness, ethical legitimacy, and institutional collaboration ultimately materialize through user-facing accessibility. Fintech Report Transparency ranks second (geomean = 0.2447), underscoring its role in sustaining regulatory trust and governance accountability, particularly in ensuring system stability and credibility. Institutional Image follows closely (geomean = 0.2112), reflecting the importance of reputational trust and moral legitimacy in reinforcing public confidence in Islamic digital finance platforms. Conversely, Institutional Networking records the lowest priority (geomean = 0.1406), indicating that while inter-institutional collaboration remains essential, it is perceived as a supportive mechanism rather than a primary infrastructural driver. Collectively, these geomean results highlight a structural shift from expert-specific orientations toward a shared emphasis on functional accessibility as the core infrastructural determinant in the ANP-based consensus model. The following are the geometric mean results.

MSE Requirement sub-criteria

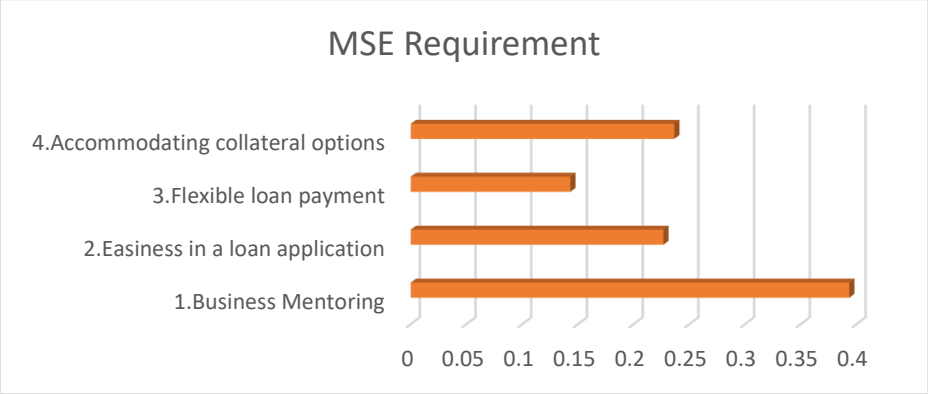

Figure 11. The Geometric Mean Results from MSE Requirement
(source: processed data, 2024)

Building upon the individual expert perspectives, the geometric mean results derived from the ANP framework delineate a clear hierarchy of priorities for MSE requirements within the Islamic digital finance ecosystem. Business Mentoring emerges as the most dominant sub-criterion (geomean = 0.3936), indicating that, despite varied expert orientations, collective judgment converges on capacity-building and managerial guidance as the foundational enabler of sustainable MSME engagement. This finding reflects a synthesis of regulatory prudence, ethical accountability, and social empowerment, where mentoring operates as a mechanism for risk mitigation and value alignment rather than merely an auxiliary support function. Accommodating Collateral Options ranks second (geomean = 0.2365), underscoring the importance of adaptive collateral frameworks that balance financial discipline with inclusivity. Easiness in Loan Application follows closely (geomean = 0.2267), suggesting that procedural simplicity functions as an access facilitator but remains insufficient without accompanying institutional guidance and governance safeguards. In contrast, Flexible Loan Payment records the lowest priority (geomean = 0.1432), implying that repayment flexibility is collectively perceived as a downstream outcome—enabled by prior capacity development, structured access, and ethical oversight—rather than a primary requirement. Collectively, these geomean results highlight a structural orientation toward long-term capability

enhancement over short-term transactional convenience within the ANP-based consensus model. The following are the geometric mean results.

Compliance Sub-Criteria

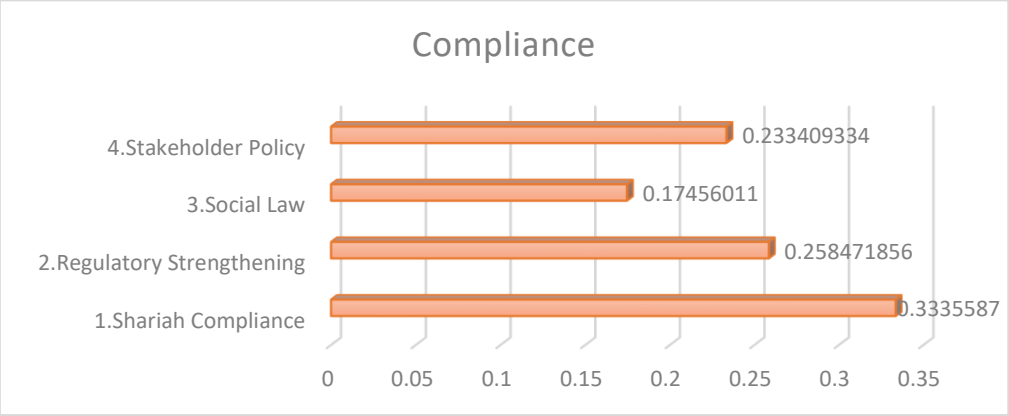

Figure 12. Geomean Results of Experts from Compliance
(source: processed data, 2024)

The geomean results indicate that Shariah Compliance emerges as the most dominant compliance sub-criterion (geomean = 0.3336), underscoring a shared expert consensus that adherence to Sharia principles constitutes the primary source of legitimacy and trust in Islamic digital finance. This finding aligns with normative perspectives emphasizing maqasid al-shariah as the ethical backbone of financial innovation. Regulatory Strengthening ranks second (geomean = 0.2585), highlighting the necessity of formal regulatory frameworks and supervisory mechanisms to institutionalize Sharia values and ensure systemic stability. Stakeholder Policy follows closely (geomean = 0.2334), indicating that coordinated governance among regulators, financial institutions, fintech platforms, and social finance actors is perceived as a critical enabling mechanism for effective compliance implementation. In contrast, Social Law records the lowest priority (geomean = 0.1746), suggesting that broader societal legal norms, while important, are collectively viewed as contextual enablers rather than primary drivers of compliance within the Islamic digital finance architecture. Collectively, these geomean results reveal a structural orientation toward substantive ethical conformity reinforced by regulatory authority and stakeholder coordination, rather than reliance on socio-legal formalism alone.

ISF Purpose Sub-Criteria

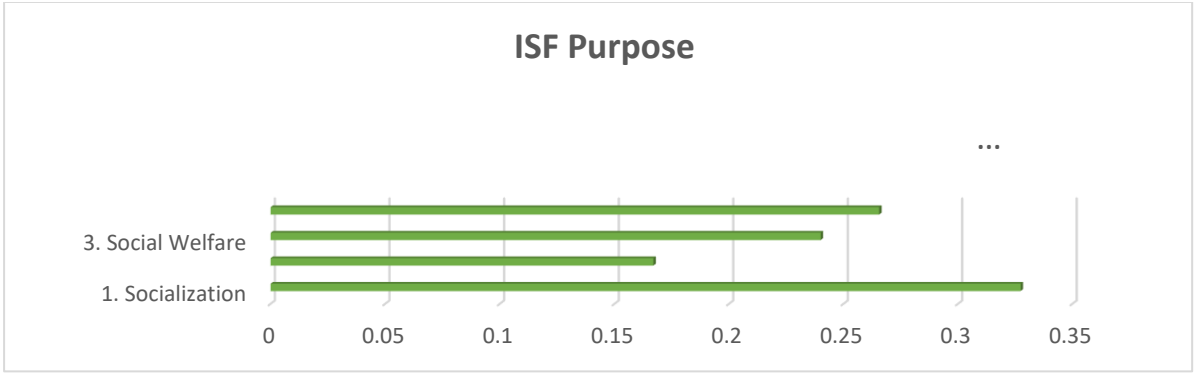

Figure 4.13 Geomean Results of Experts from ISF Porpose
(source: processed data, 2024)

The geomean results indicate that Socialization emerges as the most dominant ISF purpose (geomean = 0.3274), highlighting a shared expert consensus that public awareness, literacy, and dissemination of Islamic social finance values constitute the primary foundation for sustainable impact. This finding suggests that effective welfare delivery and economic empowerment are perceived as contingent upon prior socialization processes that build trust, participation, and institutional legitimacy. Economic Welfare ranks second (geomean = 0.2656), reflecting the collective emphasis on long-term income generation, productivity enhancement, and sustainable livelihoods as core objectives of ISF interventions. Social Welfare follows closely (geomean = 0.2400), indicating that distributive and protective welfare functions remain central, yet are increasingly viewed as complementary to broader economic empowerment strategies. In contrast, Solution during a Crisis records the lowest priority (geomean = 0.1670), suggesting that emergency response is collectively perceived as a reactive and situational function rather than the primary strategic orientation of ISF. Collectively, these geomean results reveal a structural preference for proactive, capability-building, and sustainability-oriented ISF purposes over short-term crisis mitigation.

Alternative Model Result

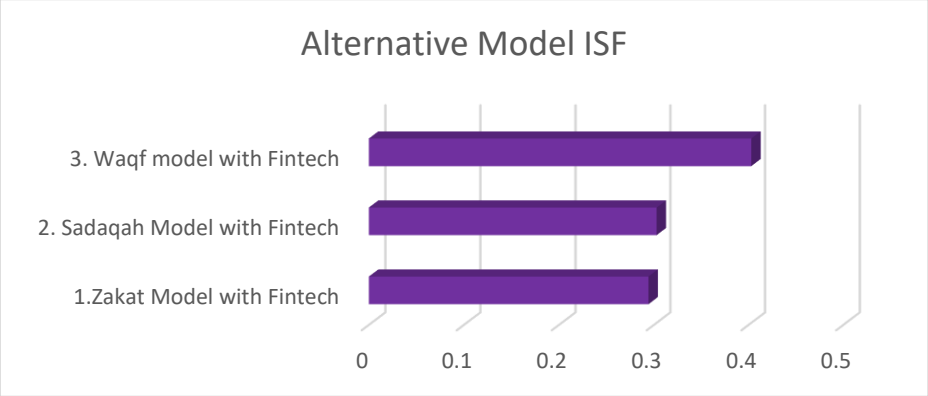

Figure 4.15 Geomean Results of Experts from Alternative model of ISF
(source: processed data, 2024)

The geometric mean results indicate that the Waqf Model with Fintech ranks first with the highest aggregated weight (0.4028), followed by the Sadaqah Model with Fintech (0.3029) and the Zakat Model with Fintech (0.2943). These values demonstrate a clear ordering among the three alternatives, with the waqf-based model showing a noticeably higher priority compared to the other two models. Although the weights of the Sadaqah Model with Fintech and the Zakat Model with Fintech are relatively close, the sadaqah-based model slightly outperforms the zakat-based model in the aggregated ranking. This narrow difference suggests that experts perceive both models as having comparable levels of importance within the evaluated decision framework, while still recognizing a marginal preference for the sadaqah-based alternative.

Discussion of Findings

This study discusses the ANP results by aligning them with the research objectives to explain how digital-based Islamic Social Finance (ISF) models can effectively support micro and small enterprises (MSEs) during crisis conditions. The findings show that infrastructure is the most influential criterion, followed by MSE requirements, compliance, and ISF purpose, indicating that operational readiness and demand-side relevance are more decisive than normative

goals in crisis contexts. This priority structure confirms that digital ISF effectiveness depends on a strong technological and institutional foundation that enables Shariah-compliant and MSE-oriented interventions (Widiastuti et al., 2022).

Regarding the first four objectives, the results highlight that compliance functions as an institutional safeguard ensuring Shariah legitimacy and regulatory trust, while MSE requirements emphasize the importance of mentoring, simplified access, and flexible mechanisms to address real business constraints during crises (Ascarya & Sakti, 2022b). Meanwhile, infrastructure emerges as the core enabler of digital ISF, with technology reliability, institutional integration, and data management playing crucial roles in ensuring timely, transparent, and scalable support for MSEs (Arner et al., 2015). Although ISF purpose ranks lowest, it provides strategic direction by aligning digital interventions with broader goals of socialization, economic welfare, and long-term recovery rather than short-term relief alone (Sairally, 2013b).

For the fifth objective, the analysis shows that digital waqf is the most effective ISF instrument for sustainable post-crisis MSE empowerment, followed by digital sadaqah and digital zakat. Zakat is primarily suited for immediate crisis mitigation, sadaqah supports transitional recovery with flexible mechanisms, and waqf enables long-term growth through productive and asset-based financing (Tahiri Jouti, 2019; Mohammed Obaidullah, 2013). Overall, the findings emphasize that an integrated digital ISF model, combining zakat, sadaqah, and waqf according to different crisis phases, offers the most robust and sustainable approach to strengthening MSE resilience and inclusive economic recovery in Indonesia.

Conclution

This study concludes that the effectiveness of a digital-based Islamic Social Finance (ISF) model for supporting Micro and Small Enterprises (MSEs) during crisis periods is primarily determined by infrastructure readiness as the main operational enabler, followed by alignment with MSE needs and strong compliance mechanisms. The ANP results further indicate that among alternative models, digital waqf is the most suitable instrument for long-term recovery and sustainable MSE empowerment, while digital sadaqah serves a flexible role in transitional recovery and digital zakat functions as a critical tool for immediate crisis mitigation. Overall, the findings confirm that an integrated digital ISF model combining zakat for short-term relief, sadaqah for adaptive support, and waqf for sustainable growth offers the most effective and Shariah-compliant approach to strengthening MSE resilience in crisis-prone economic environments.

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