

Integrating Open Banking and Islamic Finance: A Qualitative Study of Micro Enterprise Inclusion in Yogyakarta

Satria Bagus Pratama¹, Heri Kurniawan²

^{1,2} Faculty of Islamic Economics and Business, UIN Salatiga, Indonesia

Abstract. This study explores how open banking enabled digital financial services influence the financial behavior, credit access, and inclusion of micro enterprises in the Special Region of Yogyakarta, Indonesia. Using a qualitative, descriptive exploratory approach through in depth semi structured interviews with micro enterprise owners, fintech providers, Islamic banking officers, regulators, and association representatives, the study identifies four interrelated themes: digital footprints as instruments of empowerment, data sharing and open APIs as facilitators of credit access, Sharia aligned digital services as enablers of trust and adoption, and persistent literacy and infrastructure barriers constraining inclusion. Findings reveal that open banking enhances the visibility and credibility of micro enterprises, enabling more equitable financing opportunities, while Sharia compliance strengthens user confidence and ethical participation. Theoretically, the study integrates Financial Inclusion Theory, the Technology Acceptance framework, and Maqāṣid al-Shariah, proposing a hybrid model of Islamic digital inclusion where technological innovation and ethical responsibility co evolve. Practically, it underscores the need for robust data governance, literacy programs, and Sharia compliant innovation to ensure that digital transformation advances both equity and spiritual accountability. This research contributes novel insights by linking open banking and Islamic finance at the micro enterprise level, demonstrating how digital footprints and faith based trust jointly shape inclusive financial ecosystems in emerging economies.

Keywords: Open Banking, Islamic Finance, Digital Financial Inclusion, MicroEnterprises, Maqāṣid al-Shariah

1 INTRODUCTION

In recent years, the rapid expansion of digital technologies in the financial sector has significantly reshaped the landscape of financial inclusion worldwide. Globally, innovative frameworks such as open banking and open finance are increasingly recognized as key enablers of access, efficiency, and competition in financial services (World Bank, 2023). In Indonesia, such transformations are particularly salient given the country's large unbanked population, heterogeneous geography, and the rising prominence of micro and small enterprises (MSEs) as drivers of economic growth (Bank Indonesia, 2024; World Bank, 2023). According to the Otoritas Jasa Keuangan (OJK) and the Badan Pusat Statistik (BPS), the financial inclusion index in Indonesia was 75.02% in 2024, while the financial literacy index stood at 65.43% (Otoritas Jasa Keuangan, 2024). Notwithstanding this progress, Indonesia still reports one of the highest numbers of unbanked adults globally approximately 97.74 million individuals, or nearly 48% of the adult population (DBS Bank, 2024). The persistence of financial exclusion alongside digital innovation presents a compelling paradox: while digital tools hold promise for inclusive finance, significant segments of the population remain underserved.

In response, Indonesian financial regulators and industry actors are intensifying efforts to leverage open banking frameworks and digital platforms to extend financial services to underserved markets including micro enterprises and rural communities (World Bank, 2023). The institutional push toward open application programming interfaces (APIs), data sharing between banks and fintech firms, and enhanced digital footprints aims to empower small operators to access credit, manage transactions, and integrate into the formal financial system (Fajri, 2024; World Bank, 2023). The concept of open banking thus functions not only as a technological innovation but also as a potential catalyst for inclusive finance, particularly for micro enterprises that historically have lacked formal banking relationships (Fajri, 2024; Muqorobin, 2021).

Despite these positive signals, there remain gaps in our understanding of how open banking is experienced among micro entrepreneurs in emerging markets especially within the Islamic finance and microfinance context, and in regional settings such as the Special Region of Yogyakarta, Indonesia. Previous studies have explored the readiness of Indonesian banks for open banking (Muqorobin, 2021) and compared personal data protection in

¹ Corresponding author: heri.kurniawan@uinsalatiga.ac.id
No Hp/WA: +6285643395298

open banking regimes (Fajri, 2024), yet there is limited empirical evidence on how micro enterprises perceive, adopt, and are impacted by open banking enabled services in practice. Notably, while digital financial inclusion

has been widely studied, relatively few qualitative investigations examine the mechanisms by which open banking technologies influence micro-enterprise behaviours, financial footprints, credit access, and sustainability in a local Indonesian context. Moreover, the literature on Islamic finance inclusion in Indonesia shows particularly low syariah financial inclusion: for example, in 2024 the syariah literacy index was only 39.11% and syariah inclusion amounted to 12.88% (Otoritas Jasa Keuangan, 2024). This indicates a dual challenge: the adoption of digital/open banking models and the alignment with Islamic finance principles in a majority Muslim context.

Thus, there is a substantive research gap at the intersection of open banking adoption, micro enterprise financial behaviour, and Islamic aware financial inclusion in the Indonesian regional setting. This study addresses that gap by investigating how open banking enabled digital financial services influence micro enterprise behaviour, access to credit, and operational transparency in the Special Region of Yogyakarta. In so doing, it contributes both to theory and practice. Theoretically, it extends the understanding of open banking as an instrument of inclusive finance in emerging markets and connects it to behavioural finance frameworks, micro enterprise adoption dynamics, and Islamic finance considerations. Practically, the findings provide insights for regulators, banks, fintech firms, and development agencies seeking to design inclusive financial ecosystems attuned to local contexts, digital literacy constraints, and syariah ethics.

From a policy perspective, the implications are sizeable: Indonesia aims for a financial inclusion index of 90% by 2024 under POJK No. 3/2023 (Otoritas Jasa Keuangan, 2023). Understanding how open banking impacts micro enterprises can inform the design of regulatory frameworks, digital infrastructure investments, and literacy programmes in regional economies. From a behavioural finance perspective, this study offers an original lens into how micro enterprises make decisions when they gain increased digital footprints, automated reporting, and transparency, thereby altering creditworthiness, risk perception, and perhaps broader financial behaviours. This dual contribution places the study squarely at the nexus of digital finance innovation, micro-enterprise behaviour, and inclusive Islamic finance.

The purpose of this study is to explore how open banking enabled digital financial services influence micro enterprise financial behaviour and inclusion in the Special Region of Yogyakarta, Indonesia. Specifically, it aims to examine (1) the mechanisms by which digital footprints and data sharing improve micro enterprises' access to credit and financial services, (2) the impediments and facilitators in the adoption of open banking by micro enterprises, and (3) the implications for policy and Islamic finance inclusion.

2 LITERATURE REVIEW

2.1 Conceptual Background

Financial inclusion is broadly defined as the access to and use of high quality, affordable financial services such as payments, savings, credit, and insurance by individuals and enterprises, especially those historically excluded (Allen et al., 2016). In the Indonesian context, the issue of inclusion is acute: recent work notes that even with digital finance expansion, millions of adults remain unbanked or underbanked (Suhardi, 2025). On the micro enterprise side, in Indonesia micro enterprises constitute nearly 99 % of all businesses, yet many remain outside formal finance channels (Angelina et al., 2018).

Digital financial services (DFS) aims to overcome legacy barriers by using mobile and internet channels to deliver inclusive finance (Angelina et al., 2018). However, as the Pulse Lab Jakarta study shows, access is only part of the story: usage, trust, agent networks, and business case matter (Angelina et al., 2018).

In parallel, the concept of open banking (or open finance) has emerged, largely in more mature jurisdictions, as a mechanism to share customer data (with consent) via APIs so that banks, fintechs, and third parties can build services and increase competition, innovation and inclusion (Billiam, 2022). In Indonesia, the introduction of a National Open API Payment Standard (SNAP) is a key step toward enabling bank fintech interlinking (Sugarda, 2023).

Finally, within an Islamic finance context, Islamic financial inclusion refers to the equitable access to Sharia-compliant financial services (prohibiting *riba*, *gharar*, *maysir*) for underserved populations (Supriadi, 2025). The literature emphasises that Islamic microfinance, Sharia fintech and ethical financial models can provide alternative pathways of inclusion (Maharani et al., 2024; Wafi, 2025). Taken together, the conceptual terrain of financial inclusion, digital/open banking, micro enterprise finance and Islamic finance overlap in the context of developing markets. But the specific alignment of open banking, digital footprints, micro enterprises and Islamic finance is far less explored.

2.2 Theoretical Framework

The engagement of this study is supported by three theoretical lenses: Financial Inclusion Theory, Technology Acceptance (via digital footprints/data sharing), and Maqāṣid al-Shariah (in the Islamic finance realm). 1. Financial

Inclusion Theory emphasises that access to formal financial services enhances welfare, reduces poverty, and enables economic empowerment (Allen et al., 2016). It further posits that inclusion is not only access but sustained usage, affordability, and appropriate product design. 2. Technology Acceptance / Data-Driven Financial Behaviour Theory: Innovation adoption theories (such as the Technology Acceptance Model) describe how perceived ease of use, perceived usefulness, trust, and behavioural intention drive uptake. In the digital finance domain, the notion of digital footprints and open banking extends the idea: organisations can capture rich data (transaction, behaviour) which alters credit scoring, risk assessment and service delivery. Users' behaviour is thus influenced by new affordances of data sharing and integration. 3. Maqāsid al-Shariah Theory in the Islamic finance literature emphasises the higher objectives of Shariah such as protection of wealth (*ḥifẓ al-māl*), promotion of equitable distribution (*'adl*), and welfare (*maṣlaḥah*) (Chapra, 2018). From the financial inclusion standpoint, enabling underserved Muslim populations to access Sharia compliant financial services aligns with maqāsid by supporting social justice and economic empowerment (Wafi, 2025).

In summary, this study locates itself at the intersection of these three theoretical domains: enabling digital/open banking for micro enterprise inclusion (financial inclusion theory), through data sharing and adoption mechanisms (technology acceptance/data theory), while ensuring alignment with Shariah objectives (maqāsid). The theoretical logic is that enhanced digital footprints via open banking increase data availability, thereby influencing micro enterprise financial behaviour, credit access, and operational transparency particularly relevant in an Islamic aware microfinance ecosystem.

2.3 Empirical Studies

2.3.1 Digital Financial Services and Micro Enterprise Inclusion

Research in Indonesia by Angelina et al., (2018) reveals how fintech enabled micro merchants to adopt mobile savings, payments and peer to peer lending with key enabling factors being trust in agent networks, literacy, and relevance of use cases. They found that despite supply of fintech solutions, many micro merchants remain unbanked because the service design did not fit their cash based business model or social norms (Angelina et al., 2018). More recently, a survey of 5,553 MSMEs in Indonesia found that digital transformation of financial services is positively associated with financial inclusion and enterprise productivity, though infrastructure and literacy remain constraints (Walangitan, 2025). Triwibowo, (2025) demonstrates that the digital dimension of the inclusion index merits recalibration given the growth of DFS.

2.3.2 Open Banking / Open API Studies

In the Indonesian context, Muqorobin, (2021) conducted a qualitative study of Indonesian banks readiness to implement open API based open banking, finding that while the regulatory intent exists, actual connectivity, data sharing and consumer consent mechanisms are weak. Further, Sugarda, (2023) compares Indonesia with the UK and argues that Indonesia's open banking regime remains 'open payments' rather than fully open banking, with implications for inclusion of MSMEs. Billiam, (2022) emphasises the urgency of open API standardisation for banks fintech interlinking. These works, however, focus primarily on institutional/regulatory readiness rather than micro enterprise behavioural outcomes.

2.3.3 Islamic Fintech and Financial Inclusion

Maharani et al., (2024) examine Sharia fintech in Kisaran City and find that use of Sharia fintech by MSMEs positively influences financial inclusion, though the sample is small and generalizability limited. Suhardi, (2025) uses bibliometric mapping to show that Islamic financial inclusion literature is growing but notes a paucity of empirical research linking Sharia fintech adoption, micro enterprise behaviour and digital footprints. Wafi, (2025) reviews Islamic banking and inclusion in Southeast Asia and indicates a strong positive relationship, but again emphasises need for studies which address digital innovation and micro segments.

2.3.4 Barriers and Mechanisms

Asngari, (2023) finds for MSMEs in Indonesia that capital, credit risk and liquidity are major determinants of inclusion, while profitability and inflation are less so. Rozalinda et al., (2024) in a study of unbanked women micro entrepreneurs in West Sumatra find that financial literacy and participatory group mechanisms improve inclusion outcomes. These studies emphasize socio behavioural and structural barriers yet rarely focus on how digital data sharing infrastructures (open banking) alter those mechanisms.

2.3.5 Research Gap

Collectively, the empirical literature shows that digital finance, fintech, Islamic fintech and open banking readiness are each associated with inclusion. However, gaps remain: 1. Few studies explore how open banking enabled digital footprints and data sharing processes influence micro enterprise financial behaviours, credit access and inclusion in regional Indonesian settings. 2. The integration of Islamic finance principles (Sharia compliant fintech, maqāṣid focus) with open banking adoption in micro enterprises remains under-researched. 3. Most open banking studies in Indonesia focus on institutional/regulatory readiness rather than micro enterprise uptake and behavioural outcomes.

2.3.6 Emerging Conceptual Framework

From the reviewed literature, a conceptual logic emerges: open banking APIs and digital data sharing (entity A) → increased digital footprints and transactional transparency for micro enterprises (B) → improved access to tailored financial services (credit, digital payments, record-keeping) (C) → increased financial inclusion and enhanced micro enterprise behaviour/performance (D). Overlaying this pathway is the Islamic finance lens: financial services that align with Shariah values and maqāṣid mediate or moderate the pathway, especially in a majority Muslim regional context. In other words, this study examines how the adoption of open banking enabled services (A) influences micro enterprises digital footprints (B), which in turn affects credit access and inclusion outcomes (C → D), all while exploring how Islamic finance orientation shapes or intersects this pathway.

This chain informs the empirical focus: exploring both enabling and inhibiting mechanisms (literacy, infrastructure, regulatory environment, trust) and outcomes (behavioural change, credit access, operational transparency) among micro enterprises in Yogyakarta. By doing so, the study extends the literature by empirically examining that chain in an understudied regional and Islamic aware context.

In summary, the literature underscores that digital finance and fintech can enhance micro enterprise inclusion, that open banking holds promise but is under operationalised in Indonesia, and that Islamic finance provides an ethical frame but lacks integration with digital/open banking studies. This review thus justifies the research's rationale, theoretical grounding and unique contextual contribution.

2.3.7 Research Questions

Building upon the reviewed theoretical and empirical literature, this study seeks to address the following research questions:

1. How do open banking enabled digital financial services influence the financial behavior and inclusion of micro enterprises in a regional Islamic context such as Yogyakarta?
2. In what ways does data sharing through open APIs enhance micro enterprises access to credit and formal financial systems?
3. How do Sharia aligned principles and ethical trust shape the adoption and perceived legitimacy of open banking based financial services among Muslim micro entrepreneurs?
4. What structural and behavioral barriers constrain the integration of open banking and Islamic finance in advancing inclusive financial ecosystems at the micro enterprise level?

3 METHODOLOGY

This study adopts a qualitative research approach to explore how open banking enabled digital financial services influence micro enterprises financial behaviour, credit access, and inclusion in the Special Region of Yogyakarta. The overarching objective is to provide an in depth understanding of participants lived experiences and decision making processes around digital financial footprints and Islamic aware inclusion.

3.1 Research Design

A descriptive exploratory qualitative design was used, employing indepth semi structured interviews as the primary means of data collection. Qualitative methodology was selected because it enables the capturing of complex, contextualised experiences, perceptions, and behaviours of micro enterprise actors in their socio economic environment (Creswell & Poth, 2018). The exploratory design is particularly appropriate since the intersection of open banking, digital footprints, micro enterprise behaviour and Islamic finance inclusion in regional Indonesian settings remains under researched. The choice of in depth interviews allows participants to

articulate their experiences with digital financial services, open banking data sharing mechanisms, and Sharia compliant financial inclusion in their own language and context.

3.2 Research Setting and Context

The research was situated in the Special Region of Yogyakarta (Daerah Istimewa Yogyakarta, or DIY), Indonesia a region characterised by a significant micro enterprise sector, strong Islamic cultural foundations, and the on going push for digital financial inclusion. The institutional context includes local banks, fintech platforms, and regulatory initiatives by the Otoritas Jasa Keuangan (OJK) aimed at enhancing financial inclusion and open API frameworks. Against this backdrop, the study focuses on micro enterprises operating in rural and urban zones of DIY, which face infrastructural, literacy and compliance related challenges. The context is further enriched by the majority Muslim population in the region, making the alignment with Shariah based financial services salient.

3.3 Participants / Informants

Participants were intentionally selected on the basis of purposive sampling to ensure representation of relevant stakeholder categories: (a) micro enterprise owners who have adopted digital financial services and open banking enabled platforms; (b) executives or managers of fintech aggregator firms servicing micro enterprises; (c) bank personnel in Islamic aware or digital banking units; (d) local regulators or cooperative/association representatives engaged in digital/inclusion programmes and (e) micro enterprise support association representatives working with shariah microfinance providers. A total of five informants (coded R1 through R5) were selected, representing diverse viewpoints and functions. This number aligns with qualitative research conventions emphasizing depth over breadth and the attainment of thematic saturation (Guest et al., 2006; Saunders et al., 2018). Sampling technique was further supported by snowball referral from initial contacts so as to identify informants with rich, relevant experience in the local digital financial ecosystem. Each informant had at least three years of experience in their role and engaged in open banking or digital finance activities.

3.4 Data Collection Procedure

Data collection involved semi structured interviews, each lasting between 60 and 90 minutes. Participants were contacted via email or telephone and provided a study information sheet and consent form, assuring confidentiality and voluntary participation. Interviews were conducted in Indonesian (with some local Javanese dialect as appropriate), recorded (with permission), and transcribed verbatim. The interview guide comprised open ended questions covering themes such as: adoption of digital financial services and open banking, changes in transaction and credit behaviour, experiences of data sharing and digital footprint creation, Sharia-compliance perceptions, and barriers/facilitators to inclusion. Field notes and reflexive memos complemented the audio recordings. Ethical approval was obtained from the researcher's university ethics review board, and pseudonyms or codes were assigned to protect participant identity.

3.5 Data Analysis

The qualitative data were analysed using reflexive thematic analysis, following the six-phase process advocated by (Braun & Clarke, 2019). The steps included: (1) familiarisation with the data through repeated reading of transcripts and listening to audio; (2) generation of initial codes identifying meaningful features of the data; (3) searching for themes by collating codes into candidate themes; (4) reviewing themes by checking their coherence against coded extracts and the entire data set; (5) defining and naming themes through an iterative process of refinement; and (6) producing the report by weaving the analytic narrative with data extracts (Braun & Clarke, 2019; Caulfield, 2019). Analysis was conducted manually, supported by NVivo 12 software for organisation and traceability of codes and themes. To ensure trustworthiness, the researcher engaged in peer review of coding with an independent qualitative researcher, applied member checking by summarising emerging findings with selected informants, and maintained an audit trail of coding decisions. Credibility was enhanced via triangulation of participant perspectives across stakeholder categories; dependability was addressed through consistent application of the analytical framework; confirmability was supported via reflexive notes and transparent documentation; and transferability was aided by rich description of the research setting and participant context (Lincoln & Guba, 1985).

3.6 Research Ethics

Ethical compliance adhered to standard qualitative research protocols. All participants provided informed written consent and were free to withdraw at any time. Audio recordings were stored securely and transcripts anonymised. Pseudonyms (R1–R5) were used in reporting to safeguard identities. Confidentiality of institutional respondents was preserved and no direct identifying information is reported. The study respected participants' rights to voice their experiences and promised no negative repercussions for non-participation or responses.

4 FINDINGS AND DISCUSSION

The thematic analysis of the in-depth interviews conducted with MSME respondents revealed a structured and dynamic pathway toward Islamic financial inclusion through open banking. Rather than reflecting a simple linear progression, the process represents a layered transition driven by both technological innovation and socio-behavioral factors. Six core themes emerged from the data: (1) pre-digital access, (2) adoption and socialization, (3) efficiency and transparency, (4) trust and security, (5) financing and market access, and (6) barriers and solutions. Together, these themes capture how respondents experience, interpret, and negotiate the use of Islamic digital financial services in their daily economic lives.

Table 1. Summary of Thematic Findings on Open Banking and Islamic Finance Inclusion

Theme	Key Description	Representative Informants	Illustrative Insight
Pre-Digital Access	Microenterprises relied on cash transactions and manual bookkeeping, with limited access to formal credit.	R1, R5	"I used to record everything in a notebook; now transactions go automatically into the app."
Adoption and Socialization	Open banking solutions were introduced through community networks and local support institutions.	R1, R4, R5	"I learned about this application from friends in the cooperative and the association."
Efficiency and Transparency	Non-cash transactions and automated records accelerate audit processes and improve cash-flow control.	R1, R2, R3	"Now I can monitor cash flow in real time."
Trust and Security	Trust increases due to OJK oversight, security certifications, and Sharia-compliant product design.	R3, R4	"There are two authentication steps, so it feels safer."
Financing and Market Access	Digital business data facilitate credit approval and broaden customer reach.	R1, R2, R5	"The bank approves loans faster because my business data are complete."
Barriers and Solutions	Barriers include low literacy, weak connectivity, and transaction costs; solutions involve training and supportive regulation.	R1–R5	"We need free digital training and reliable internet in the village."

4.1 Theme 1: Pre-Digital Access

Respondents described their initial financial situation as heavily constrained by cash-based transactions, informal borrowing, and manual bookkeeping. Limited documentation, lack of collateral, and the dominance of informal arrangements prevented many MSMEs from accessing formal credit schemes. Several participants explained that they relied on notebooks or memory to track sales and expenses, making it difficult to demonstrate business performance to banks or Islamic financial institutions. This condition is consistent with prior evidence that pre-digital business actors in Indonesia remain financially excluded despite high levels of micro-entrepreneurial activity (Wiryawan, 2024). In this study, pre-digital access thus represents the structural baseline from which the transition to open banking and Islamic finance begins.

4.2 Theme 2: Adoption & Socialization

Adoption of digital financial platforms did not occur spontaneously or solely as a result of technological availability. Instead, respondents emphasized the role of interpersonal influence, social learning, and community-based socialization. Information about Islamic fintech applications, digital banking features, and QR-based payment systems often spread through community groups, religious gatherings, cooperatives, and peer

recommendations. Training sessions organized by local organizations or financial institutions further reinforced this process. This pattern supports the argument that social embeddedness and collective perception are decisive in the diffusion of financial technologies (Nugraha et al., 2023). In this sense, adoption functions as a socio-cultural gateway rather than a purely technical step, shaped by trust in social networks and community leaders.

4.3 Theme 3: Efficiency & Transparency

Once adoption occurs, respondents begin to perceive the efficiency and transparency benefits of open banking and Islamic digital financial services. Participants reported that digital finance reduced administrative burdens, shortened waiting times, and increased visibility of transactions. Automatic records, real-time balance updates, and clear digital histories simplified bookkeeping and facilitated monitoring of cash flows. For entrepreneurs who must manage small but frequent transactions, these features were experienced as a substantial improvement over manual methods. The attraction to transparency resonates with findings that Islamic MSMEs value traceability of zakat, waqf, and financing flows as a form of ethical and religious assurance (Hartanto et al., 2023). In this study, efficiency and transparency reinforce continued usage of digital services and deepen user engagement; they are not the starting point of inclusion, but a key mechanism that sustains it.

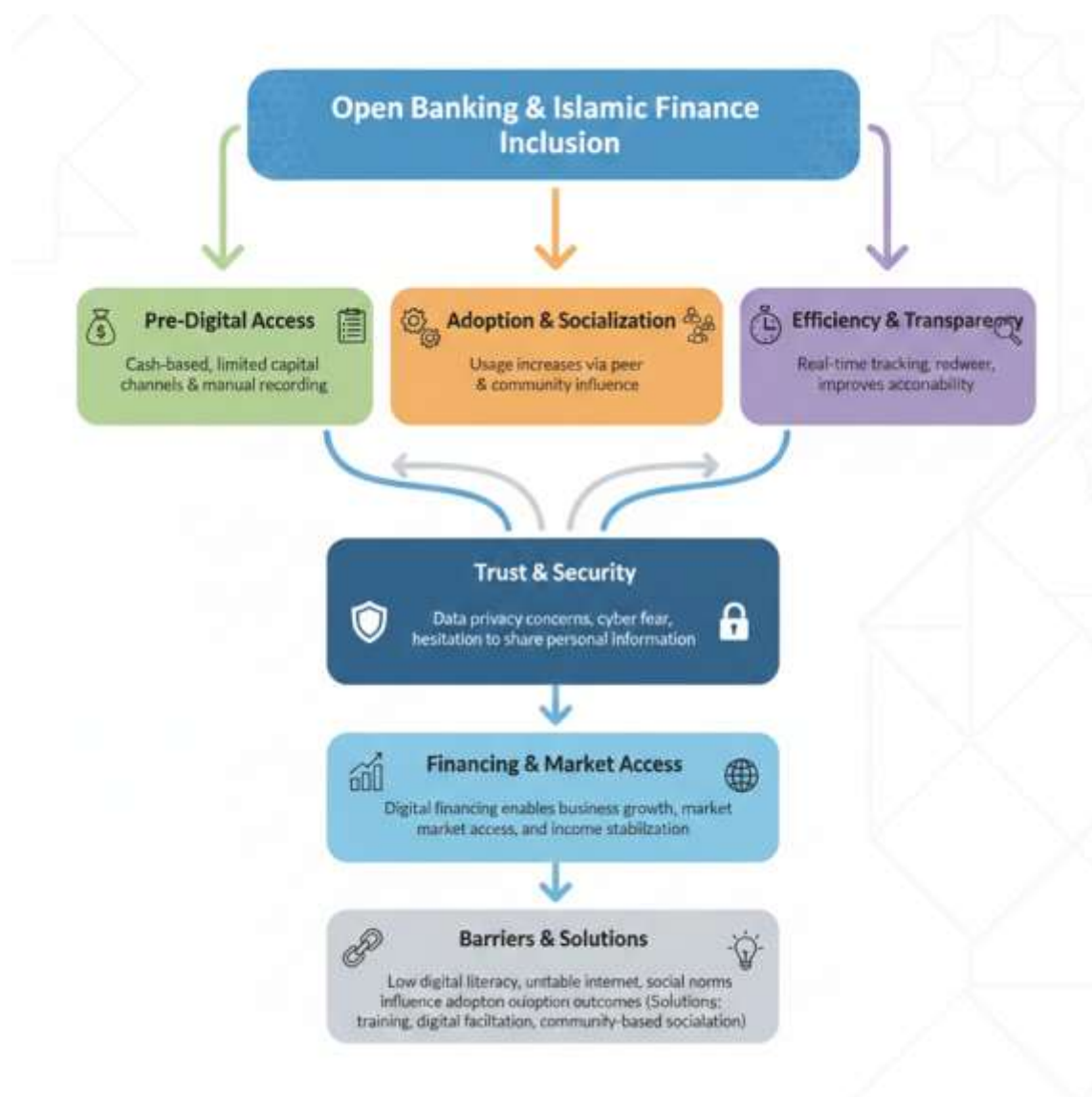


Fig. 1. Thematic map of open banking and Islamic finance inclusion based on participants' experiences

4.4 Theme 4: Trust & Security

Trust emerged as a pivotal theme that links technological features with religious values and personal risk perceptions. Respondents frequently raised concerns about data privacy, cybercrime, misuse of personal

information, and the possibility of unauthorized access to their accounts. At the same time, they were attentive to the halal status and Shariah-compliant nature of the products and institutions involved. When institutions were perceived as credible—because of OJK oversight, clear security protocols, and explicit Shariah certification—participants reported feeling safer and more willing to maintain their use of digital services. Conversely, when these assurances were weak or poorly communicated, users became hesitant or reverted to cash-based practices. This confirms that trust is not merely a supplementary factor but the central anchor of digital Islamic finance (Thomas et al., 2024). The findings therefore explain why adoption alone does not automatically translate into long-term usage: sustained inclusion depends on a stable sense of digital and religious security.

4.5 Cross- Financing & Market Access

After trust has been formed, respondents begin to utilize the more advanced functionalities of open banking and Islamic fintech, particularly those related to financing and market expansion. Several participants narrated how access to digital financing helped them smooth cash-flow cycles, invest in additional inventory, or open new sales channels. Integrated payment gateways and marketplace linkages enabled entrepreneurs to reach customers beyond their immediate neighborhood. For some, this translated into more stable income, greater resilience to shocks, and the ability to plan business growth more systematically. These results are in line with evidence that open-banking-enabled Islamic fintech enhances MSME resilience and survival prospects (Maharani et al., 2024). In the trajectory observed in this study, financing and market access represent the stage at which financial inclusion becomes tangible and measurable, with clear economic and social returns.

4.6 Barriers & Solutions

Despite these benefits, respondents consistently emphasized persistent challenges that limit or slow the progression toward full digital inclusion. Low digital literacy, unstable internet connectivity, technology anxiety, and confusion about regulatory requirements were among the most frequently cited obstacles. Older entrepreneurs and those in peri-urban or rural areas felt particularly disadvantaged. Nevertheless, the data also revealed organic coping strategies: peer support, informal digital “mentors” within the community, and local facilitators who helped others navigate applications, reset passwords, or interpret system messages. These patterns point to the need for ecosystem-level interventions rather than shifting responsibility solely to individual users. The findings echo recent policy calls for collaborative literacy programs, combined socialization of Islamic financial products, and infrastructure improvements initiated jointly by regulators, financial institutions, and community organizations (Otoritas Jasa Keuangan, 2024). Barriers and solutions therefore appear as a simultaneous presence—obstacles that constrain inclusion and at the same time trigger collective experimentation to overcome them.

4.6.1 Cross-Theme Synthesis

Taken together, the six themes demonstrate that Islamic digital financial inclusion is not a technological inevitability but a socially negotiated pathway. The journey starts from a structurally constrained pre-digital context, moves through socially mediated adoption, and gains momentum through perceived efficiency and transparency. Trust then becomes the critical inflection point that determines whether users move on to deeper engagement in financing and market access, or whether they retreat to older, informal practices. Barriers and solutions cut across all stages, moderating the pace and unevenness of inclusion across different user groups. This configuration shows that technology, while necessary, is insufficient without social capital, institutional credibility, and an enabling regulatory environment.

4.6.2 Implications for Theory and Practice

Empirically, the study clarifies how Islamic financial inclusion unfolds as a sequential and contingent progression rather than a single transactional event. Theoretically, the findings support a synthesis of social capital theory, financial inclusion theory, and Maqashid Shariah. Social capital explains the importance of community networks in diffusion and problem-solving; financial inclusion theory highlights the graduated nature of access, usage, and quality; and Maqashid Shariah provides a normative lens linking protection of wealth with justice, trust, and social welfare. Practically, the results underscore the necessity of policy synchronization involving regulators, Islamic banks, non-bank Islamic financial institutions, fintech providers, and community-based organizations. Effective interventions will need to combine infrastructure investment, targeted literacy programs, product design aligned with MSME realities, and transparent communication of both digital security and Shariah compliance.

5 CONCLUSION AND RECOMMENDATIONS

5.1 Overview of the Study

This study set out to explore how open banking enabled digital financial services influence the financial behavior, credit access, and inclusion of micro enterprises in the Special Region of Yogyakarta, Indonesia. Employing a qualitative, descriptive exploratory design, the research gathered data through in depth semi structured interviews with multiple stakeholders including micro enterprise owners, fintech providers, banking representatives, regulators, and associations. The purpose was not merely to document adoption trends but to interpret the mechanisms, constraints, and ethical religious dimensions that shape the relationship between digital finance innovation and inclusive economic participation in a Muslim majority context.

5.2 Key Findings Summary

The findings underscore that open banking and digital financial technologies function as dual enablers of both operational efficiency and social empowerment. First, the creation of digital footprints through QRIS payments, virtual accounts, and automated ledgers transforms micro enterprises from invisible informal actors into data-visible entities, thereby improving their credibility and access to financing. Second, data-sharing through open APIs between banks and fintech firms reduces information asymmetry, enabling faster and more equitable credit evaluation for micro enterprises. Third, Sharia aligned digital products those explicitly compliant with Islamic finance principles enhance user trust and adoption, revealing that ethical and religious compatibility remains central to financial inclusion in Indonesia. Lastly, persistent barriers limited literacy, infrastructure deficiencies, cost sensitivity, and mistrust in digital ecosystems continue to constrain the full realization of inclusive finance.

Overall, the study reveals a dynamic interplay between technological innovation and socio religious context: while digital infrastructures expand financial accessibility, their success ultimately depends on user trust, ethical assurance, and local capability.

5.3 Theoretical Implications

Theoretically, this study contributes to the literature on digital financial inclusion and Islamic finance by advancing a hybrid conceptual understanding that connects Financial Inclusion Theory, Technology Acceptance frameworks, and Maqāṣid al-Shariah. It refines Financial Inclusion Theory by introducing the digital footprint as a new form of “non-traditional collateral,” which bridges the credibility gap between unbanked micro enterprises and formal institutions. Moreover, it extends the Technology Acceptance Model (TAM) by demonstrating that perceived trust and Sharia compliance act as powerful moderating variables in technology adoption particularly in religiously conscious markets (Supriadi, 2025).

From the perspective of Maqāṣid al-Shariah, the findings reaffirm that promoting access to ethical, transparent, and Sharia compliant financial services fulfills higher objectives such as the protection of wealth (*ḥifẓ al-māl*) and the advancement of societal welfare (*maṣlaḥah*). Thus, the study contributes a contextualized model of Islamic digital inclusion, where technological innovation and moral responsibility co evolve as interdependent forces driving equitable economic participation.

5.4 Practical and Policy Recommendation

5.4.1 Policy Level Recommendations

At the regulatory level, the Otoritas Jasa Keuangan (OJK) and Bank Indonesia should strengthen open API standards and data governance frameworks to facilitate secure, consent based data sharing among banks, fintechs, and micro finance institutions. This would help standardize risk assessment for micro enterprises and encourage broader interoperability across Islamic financial institutions. Policymakers should also integrate Islamic finance considerations into digital inclusion roadmaps, ensuring that Sharia compliant fintechs and Islamic banks can access innovation sandboxes and digital infrastructure support.

5.4.2 Institutional Level Recommendations

Financial institutions and fintech providers should leverage digital footprints for alternative credit scoring and product personalization while maintaining strong data privacy safeguards. Banks and Islamic micro finance institutions (BMTs, BPRS) are encouraged to develop Sharia digital micro credit schemes that use transaction histories instead of physical collateral, reflecting the principles of trust and fairness embedded in Islamic finance. Training programs for fintech developers should include modules on Maqāṣid al-Shariah and ethical data governance to ensure alignment between innovation and Islamic values.

5.4.3 Community Level Recommendations

At the grassroots level, digital and financial literacy programs should be intensified, particularly for micro enterprises in rural and semi urban areas. Partnerships between local cooperatives, mosques, universities, and fintech firms could serve as community “digital literacy hubs.” Social campaigns should focus on building trust in digital finance clarifying issues such as data protection, cyber security, and Sharia compliance in accessible local languages. By fostering digital trust capital, communities can enhance both the adoption and the sustainability of open banking based inclusion initiatives.

5.4.4 Limitations and Future Research

While the study provides deep qualitative insights, it is limited by its regional focus and modest number of informants. The findings reflect perspectives from Yogyakarta and may not capture regional variations across Indonesia. Additionally, the qualitative approach emphasizes interpretation over measurement; thus, future studies could employ mixed method designs to quantify the relationships identified here such as between digital footprint strength and access to Islamic micro credit. Comparative research across provinces or between Muslim majority and non Muslim majority contexts could illuminate how cultural, regulatory, and infrastructural differences mediate digital inclusion outcomes.

Future work might also explore cross instrument synergies linking open banking with other Islamic social finance mechanisms such as zakat and waqf to examine how combined digital ecosystems can promote both inclusion and welfare redistribution.

5.4.5 Closing Reflection

In conclusion, this study demonstrates that open banking enabled digital financial services, when harmonized with Sharia compliant ethics, can transform Indonesia’s micro enterprise landscape. Technology alone does not guarantee inclusion; rather, inclusion arises when digital systems are embedded within trust based, culturally attuned, and ethically governed frameworks. As Indonesia continues to pursue its 90% financial inclusion target, the lessons from Yogyakarta underscore that inclusive digital finance is not only a technical challenge but a moral and developmental imperative one that requires collaboration among regulators, institutions, and communities.

Ultimately, the integration of open banking and Islamic finance principles represents a powerful model for equitable, values driven financial transformation advancing both economic justice and spiritual accountability in the evolving landscape of digital inclusion.

References

- Allen, F., Demirgüç-Kunt, A., Klapper, L., & Peria, M. S. M. (2016). The foundations of financial inclusion: Understanding ownership and use of formal accounts. *Journal of Financial Intermediation*, 27, 1–30. <https://doi.org/10.1016/j.jfi.2015.12.003>
- Angelina, M., Fachry, N., Kuwatly, D., & Setiawan, R. (2018). *Banking on fintech: Financial inclusion for micro enterprises in Indonesia*.
- Asngari, I. (2023). Determinants of financial inclusion for MSMEs: Evidence from Indonesia. *Jurnal Ekonomi Dan Bisnis*, 26(1), 75–89.
- Bank Indonesia. (2024). *Indonesia economic and financial statistics 2024*.
- Billiam, B. (2022). The urgency of open application programming interface (API) in the Indonesian implementation of open banking. *Pusat Jurnal Ilmu Hukum*, 9(1), 45–56.
- Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health*, 11(4), 589–597. <https://doi.org/10.1080/2159676X.2019.1628806>
- Caulfield, J. (2019). *How to do thematic analysis: A step-by-step guide*. <https://www.simplypsychology.org/thematic-analysis.html>
- Chapra, M. U. (2018). *Maqāṣid al-Shariah as philosophy of Islamic law: A systems approach*. International Institute of Islamic Thought.
- Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry and research design: Choosing among five approaches* (4th ed.). Sage Publications.

- DBS Bank. (2024). *Indonesia has the fourth largest unbanked population in the world*.
- Fajri, A. R. (2024). Pelindungan data pribadi nasabah di era open banking: Perbandingan antara Indonesia dan United Kingdom. *Journal of Law, Society and Information Communication*, 8(2), 45–63.
- Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? *Field Methods*, 18(1), 59–82. <https://doi.org/10.1177/1525822X05279903>
- Hartanto, S., Suparyanto, T., & Azwar. (2023). Islamic finance practices in micro, small, and medium enterprises in Indonesia: A systematic literature review. *Millah: Journal of Religious Studies*, 22(2), 435–464. <https://doi.org/10.20885/millah.vol22.iss2.art6>
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Sage Publications.
- Maharani, S., Nurbiati, N., & Dharma, B. (2024). Contribution of Sharia fintech to MSMEs' inclusivity in Kisaran City. *Journal of Islamic Economics Lariba*, 10(1), 117–130. <https://doi.org/10.20885/jielariba.vol10.iss1.art7>
- Muqorobin, M. M. (2021). Pengaruh open banking berbasis open API terhadap kesiapan bank di Indonesia. *MAX: Journal of Management*, 10(1), 1–15.
- Nugraha, D. P., Setiawan, B., Jeyakumar, R., & Fekete-Farkas, M. (2023). Fintech adoption drivers for innovation for SMEs in Indonesia. *Journal of Open Innovation: Technology, Market, and Complexity*, 8(4), 208. <https://doi.org/10.3390/joitmc8040208>
- Otoritas Jasa Keuangan. (2023). *POJK No. 3/2023 on financial literacy and inclusion improvement*.
- Otoritas Jasa Keuangan. (2024). *Siaran pers: Indeks literasi dan inklusi keuangan tahun 2024*.
- Rozalinda, Y., Afrida, I., Abdullah, I., Prasajo, Z. H., Ulfah, M., Sakab, P. A., & Nelli, J. (2024). Economic empowerment of unbanked women through financial inclusion in Indonesia. *Cogent Business & Management*, 11(1), 2407921. <https://doi.org/10.1080/23311975.2024.2407921>
- Saunders, B., Sim, J., Kingstone, T., Baker, S., Waterfield, J., Bartlam, B., & Jinks, C. (2018). Saturation in qualitative research: Exploring its conceptualisation and operationalisation. *Quality & Quantity*, 52(4), 1893–1907. <https://doi.org/10.1007/s11135-017-0574-8>
- Sugarda, P. P. (2023). Enhancing the competitiveness of Indonesia's financial services sector: A comparative legal analysis of Indonesia's open banking regime. *Journal of Central Banking Law and Institutions*, 2(1), 149–178.
- Suhardi, S. (2025). Mapping Islamic financial inclusion literature: Trends, key themes and future directions. *Accounting*, 9(1), 112–130.
- Supriadi, I. (2025). Islamic financial inclusion and sustainability mindset: Evidence from East Java's MSMEs. *AL-KASB Journal of Islamic Economics*, 5(1), 89–108.
- Thomas, G. N., Ramadhanti, S. M., & Indriaty, L. (2024). The impact of financial literacy, social capital, and financial technology on financial inclusion of Indonesian students. *Development Studies Research*, 7(1), 153–166. <https://doi.org/10.1080/21665095.2024.1823238>
- Triwibowo, S. (2025). *Measuring financial inclusion in Indonesia: Asserting the role of digital financial services*.
- Wafi, I. (2025). The impact of Islamic banking on financial inclusion: A Southeast Asia review. *AL-ARBAH: Journal of Islamic Finance and Banking*, 7(1), 33–47.
- Walangitan, P. G. M. (2025). Overcoming barriers to digital financial inclusion: A case study of micro-enterprises in Tomohon, Indonesia. *Santhet*, 9(4), 49–65.
- Wiryawan, R. (2024). The impact of microfinance on the income of micro, small, and medium enterprises in Indonesia: A sectoral analysis. *Wiga: Jurnal Penelitian Ilmu Ekonomi*, 14(2), 274–285. <https://doi.org/10.30741/wiga.v14i2.1379>
- World Bank. (2023). *Inclusion through innovation in financial services: Winning over businesspeople and consumers in Indonesia*.