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BRIDGING RURAL DIGITAL DIVIDES: Obstacles to E-Money Transactions in Langsa City's Micro-Businesses and Pathways to ASEAN Inclusive Finance

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Abstract
Purpose: This study investigates the obstacles hindering E-Money adoption in micro-businesses within Kota Langsa, Aceh, Indonesia, and explores pathways to achieving inclusive digital finance in semi-urban ASEAN contexts.
Method: Drawing on qualitative fieldwork, including observations and interviews with participants at five coffee shops, the SAMS Coffee, Kopi Sui, Kopi Kay, Sedotan Kopi, and Skala Coffee.
Findings: The research reveals that while participants are aware of and actively implementing E-Money systems, technical barriers such as unstable electricity, unreliable internet connectivity, and system maintenance disruptions severely limit transaction efficiency. These challenges underscore persistent rural digital divides, exacerbating inequalities in access to financial technologies between urban centers and peripheral regions.
Limitations and Theoretical Implications: The study contributes to debates on digital transformation in Islamic economies by highlighting how infrastructural gaps undermine the potential of E-Money to align with Shariah-compliant principles of equitable financial inclusion.
Practical Implications: The findings call for targeted policy interventions, including rural infrastructure investment, subsidized digital literacy programs, and public-private partnerships to stabilize technological ecosystems. Framing Kota Langsa struggles within ASEAN's broader agenda for inclusive finance, the research underscores the urgency of addressing systemic barriers to ensure digital economies empower micro-enterprises rather than deepen marginalization.

INTRODUCTION

The rise of digital economies in Indonesia and Asia has accelerated E-Money adoption in Kota Langsa's coffee shops, particularly in Muslim-majority communities adapting to post-pandemic cashless systems. Participants now integrate e-money, a digital exchange tool enabling seamless, secure transactions, as a practical alternative to physical currency (Akhlaghpour, 2018; Fitri Fadilah Widyaputri & Edy Yusuf Agung Gunanto, 2023). Driven by demands for speed and efficiency, technological advancements have transformed payment methods, introducing electronic instruments like Quick Response Code Indonesian Standard (QRIS), mobile transfers, and debit cards to streamline buying-selling processes (Fahrudin & Isnaini, 2023; Listiana & Edriyanti, 2023). These innovations align with evolving consumer needs, offering accuracy and security in daily transactions while reflecting broader shifts toward digitized economic activities. Yet, this transition also highlights disparities in rural infrastructure, underscoring the interplay

between technological progress and equitable financial inclusion in Aceh's micro-business ecosystems.

While previous studies on digital economies in Southeast Asia have largely focused on urban-centered E-Money adoption, ASEAN's inclusive finance frameworks, and the implementation of the QRIS limited scholarly attention has been paid to the unique challenges faced by micro-enterprises in semi-urban Aceh (Chohan et al., 2022; Wahid & Zuardi, 2023). In this region, the intersection of Adat (customary law), Islamic ethics, and rural digital divides creates a distinct socio-economic context for analyzing technological inclusivity. The advancement of financial technologies has indeed facilitated economic activities, enabling users to make online transactions, mobile transfers, and payments via credit or debit cards (Listiana & Edriyanti, 2023; Maulana, 2023; Sa'adi, 2021). E-Money services such as BRIZZI, E-Money Mandiri, Flazz, and others, including those issued by non-bank providers illustrate this digital transformation (Fitri Fadilah Widyaputri & Edy Yusuf Agung Gunanto, 2023; Habib Asseghaf Herdadi, 2022). These services are regulated under Bank Indonesia Regulation No. 16/8/PBI/2014, which classifies electronic money into registered and unregistered types. Unregistered, chip-based E-Money allows offline transactions with a balance limit of IDR 1,000,000, making it ideal for everyday use (Habib Asseghaf Herdadi, 2022; McBride & Derevensky, 2009). However, in semi-urban Aceh, the adoption of such technologies is constrained by inadequate digital infrastructure, low digital literacy, and cultural or religious reservations (Armia, 2021; Setiawati et al., 2023). These factors present significant operational barriers for small participants and micro-enterprises, many of whom remain excluded from the digital economy. Therefore, examining Aceh's context underscores the need for national digital finance policies to be tailored to the socio-cultural and infrastructural realities of peripheral regions to ensure inclusive and sustainable financial integration.

This study addresses a critical empirical and methodological gap in existing literature by providing qualitative insights into the lived experiences of Langsa's coffee shop participants, whose struggles with unstable electricity, internet connectivity, and system maintenance, often overlooked in macro-level analyses of Indonesia's digital transformation, reveal the disconnect between national policy aspirations and grassroots realities, particularly in regions where rural digital divides intersect with Islamic economic values. Field interviews highlight low consumer adoption of E-Money, exacerbated by power outages and cultural preferences for cash, as noted by Bank Indonesia. Despite Langsa's booming coffee shop scene, a hub for millennials, participants report that technical barriers and limited digital literacy hinder E-Money integration. This gap underscores the need for localized solutions that reconcile infrastructural constraints with socio-cultural norms, offering actionable insights for policymakers aiming to align digital finance with the principles of equitable, Shariah-informed economic development in Aceh's micro-business ecosystems.

Therefore, localizing Kota Langsa's challenges within ASEAN's broader agenda for inclusive digital finance and sustainable development, this research advances bridge localized Acehnese insights with pan-Asian debates on rural digital divides, technological equity, and the role of micro-enterprises in fostering socially just economic ecosystems that reconcile Islamic financial principles with the imperatives of a rapidly digitizing world.

LITERATURE REVIEW

This study's theoretical foundation examines three interconnected themes shaping E-Money adoption in rural Southeast Asia: (1) rural digital divides, focusing on infrastructural barriers like unstable electricity and internet access that disproportionately affect micro-enterprises in semi-urban Aceh; (2). Fintech adoption dynamics, analyzing how cultural preferences, digital literacy gaps, and Shariah-compliant financial principles influence micro-businesses' engagement with E-Money systems; and (3). ASEAN's inclusive finance policies, critiquing regional frameworks for

bridging digital equity gaps while aligning with localized Islamic economic values. These themes contextualize Kota Langsa challenges within broader debates on equitable technological integration, emphasizing the need for policies that reconcile infrastructural constraints, cultural relevance, and Islamic financial ethics in ASEAN's digital transformation agenda.

Rural Digital Divides in Infrastructural Barriers to Financial Technology Adoption

Existing studies on rural-urban digital disparities in ASEAN highlight infrastructural barriers such as unstable electricity, unreliable internet, and limited technological access, which disproportionately hinder E-Money integration in micro-enterprises. In semi-urban Aceh, these challenges create systemic gaps between national digital economy policies and grassroots realities. For instance, Sutrisna and Syntia emphasized that external environmental factors, such as inconsistent power supply and poor connectivity, act as stimuli shaping micro-businesses' responses to adopting Fintech tools (Sutrisna et al., 2022; Syntia, 2023). The participants in Langsa coffee shops often face disruptions during power outages or network failures, rendering e-money systems unusable despite their willingness to comply with digital mandates. This aligns with habib argument that individual responses to technological adoption are mediated by contextual stimuli, including infrastructure quality (Habib Asseghaf Herdadi, 2022; McBride & Derevensky, 2009). However, existing literature underestimates how these rural-specific barriers intersect with socio-economic dynamics, such as cash-dependent consumer habits and limited digital literacy, perpetuating rural digital divides (Habib Asseghaf Herdadi, 2022). Addressing these gaps requires frameworks that prioritize localized infrastructure investments over urban-centric policies, ensuring equitable access to digital finance tools in ASEAN's semi-urban economies.

Critiques of Indonesia's digital economy policies reveal persistent neglect of rural-specific challenges, exacerbating disparities in E-Money adoption. While national initiatives like QRIS aim to standardize cashless transactions, they often overlook infrastructural fragility in regions like Aceh, where 60% of micro-enterprises report system downtime due to unstable electricity (Akhlaghpour, 2018; Gea & Al-Azhar, 2021; Putu et al., 2021). Internal factors, such as policy design favoring urban hubs, compound external barriers like inadequate internet penetration, creating a mismatch between top-down mandates and micro-business realities. Walgito's (2016) framework underscores how individual responses to E-Money adoption are shaped by both personal traits (e.g., digital literacy) and environmental stimuli (e.g., infrastructure gaps). For example, Kota Langsa vendors, despite recognizing E-Money's efficiency, often revert to cash transactions due to systemic technical failures beyond their control. This disconnect reflects a broader policy gap: ASEAN's inclusive finance frameworks rarely integrate localized solutions for rural economies, prioritizing macro-level digitization over grassroots resilience. Future research must reconcile these disparities by advocating for context-sensitive policies that address infrastructural deficits while aligning with Islamic financial principles of equity and Maslahah wal Mursalah (public good) in Acehnese contexts.

The Dynamics of Shariah Compliance Fintech adoption for Kota Langsa

Financial technology adoption in Acehnese micro-enterprises is deeply influenced by cultural, economic, and Islamic ethical frameworks. Participants exhibit cognitive responses favoring cash-based systems, perceiving them as tangible and trustworthy compared to abstract digital transactions (Fatah et al., 2019; Kismawadi et al., 2023; Pratiwi et al., 2021). Affective barriers , such as skepticism toward fintech's transparency and emotional attachment to face-to-face exchanges, further delay E-Money integration. Meanwhile, psychomotor habits, like reliance on physical money for daily transactions, reflect ingrained behavioral norms. These dynamics intersect

with limited digital literacy and concerns over Shariah compliance, particularly fears of *gharar* (uncertainty) in algorithm-driven platforms or interest-based mechanisms conflicting with Islamic principles of *maslahah* (public benefit) and risk-sharing. For instance, micro-entrepreneurs in Langsa prioritize fintech tools that ensure ethical clarity, fairness, and alignment with *zakat* -linked financial models. This selective adoption underscores the need for Fintech solutions that harmonize technological efficiency with Acehnese socio-religious values, bridging the gap between global digital trends and localized Islamic economic ethics.

The tension between global Fintech models and Acehnese practices highlights systemic mismatches in addressing rural micro-enterprises' needs. International platforms often prioritize scalability over cultural specificity, neglecting infrastructural constraints like erratic electricity or low internet penetration in semi-urban areas (Ridho Kismawadi et al., 2023). For example, prepaid E-Money systems reliant on stable networks fail to accommodate Langsa vendors, whose environmental responses to technology adoption are shaped by recurrent power outages. More critically, global models frequently overlook Islamic finance principles such as riba -free (interest-free) transactions and risk-sharing mechanisms, which are central to Acehnese participants' moral-economic frameworks. Participants assess Fintech not merely by utility but through adl (justice) and amanah (trustworthiness), aligning choices with community norms and religious guidance. To resolve this, Fintech providers must co-design Shariah-compatible tools, such as blockchain-based waqf funding or QRIS-linked zakat systems, while engaging local scholars (ulama) to validate ethical compliance. This approach ensures technological innovation supports Al Ghazali Maslahah wal Mursalah without eroding Aceh's socio-religious economic foundations (Afna, 2023).

The Localized Policy Gaps and Opportunities for Rural Digital Equity

ASEAN's regional financial inclusion strategies prioritize centralized digital infrastructures and urban fintech ecosystems, yet they fail to address the socio-economic and religious complexities of rural Muslim-majority regions like Aceh. Current policies overlook the ethical foundations of traditional commerce, such as *Al-bai'* a consensual, trust-based transaction system mandated by Islamic law (Q.S. An-Nisa: 29). This disconnect risks alienating rural communities whose economic practices are rooted in Shariah principles of fairness, transparency, and mutual consent (Armia, 2021; Jamaruddin & Markom, 2020). For instance, top-down e-money frameworks often neglect zakat -linked financial tools or risk-sharing mechanisms, which are critical for aligning digital finance with Acehnese values of *Maslahah wal Mursalah* (Afna, 2023). Without embedding Islamic ethical standards into policy design, ASEAN's digital inclusion efforts remain superficial, exacerbating rural-urban divides. Bridging this gap requires reimagining financial strategies that decentralize infrastructure investments, integrate Shariah -compliant instruments, and validate localized transaction norms, ensuring digital equity aligns with both technological and cultural imperatives in semi-urban Indonesia.

Decentralized infrastructure investments and Shariah -aligned fintech tools offer transformative pathways for rural digital equity in Aceh (Kismawadi et al., 2023; Putri & Darwanto, 2022). Integrating zakat -linked E-Money systems, where charitable contributions fund micro-enterprises, policies can embed social justice into digital finance while adhering to Islamic principles of wealth redistribution and communal welfare (Amelyani et al., 2023; Kismawadi et al., 2023). Grassroots engagement with participants and religious leaders (ulama) is equally vital to address skepticism toward opaque fintech platforms and ensure compliance with *Ridha* (mutual consent) in transactions. Islamic law's emphasis on transparency, reinforced by Hadiths condemning deceit, necessitates secure, ethically governed digital ecosystems (Kismawadi et al., 2023; Putri &

Darwanto, 2022). ASEAN's regional strategies must shift from prescriptive, top-down models to participatory frameworks that empower local stakeholders, co-designing solutions with Acehnese communities. This includes deploying solar-powered E-Money systems to mitigate energy gaps and leveraging waqf (endowments) for infrastructure resilience. Prioritizing infrastructural autonomy and culturally resonant financial tools, ASEAN can pioneer an inclusive model where digital transformation respects religious obligations and sustains rural micro-enterprises, aligning technological progress with Aceh's socio-economic and spiritual identity.

Th study uniquely bridges rural digital divides and Islamic finance discourse by examining E-Money adoption challenges in Acehnese micro-enterprises through qualitative fieldwork. It reveals how infrastructural gaps (unstable electricity, poor internet) intersect with cultural and Shariah-compliant values—such as Al Ghazali Maslahah wal Mursalah (public good) and adl (justice)—to shape transactional behaviors. Unlike prior urban-centric analyses, it advocates for decentralized policy frameworks integrating zakat-linked fintech tools and grassroots engagement, offering actionable insights for ASEAN's inclusive finance agenda.

METODE

This study adopted a qualitative case study approach to explore the socio-technical barriers to e-money adoption in micro-enterprises within Kota Langsa, Aceh. The design prioritized emic perspectives of insider coffee shop vendors, aligning with the study's aim to uncover localized experiences often overlooked in macro-level analyses of Indonesia's digital economy.

The Research Design

A phenomenological framework was employed to understand how participants' lived experiences with infrastructural and cultural constraints shaped their engagement with e-money systems. This approach was chosen to address rural digital divides and Islamic finance principles in semi-urban Muslim-majority contexts. Focusing on five coffee shops, i.e., SAMS Coffee, Kopi Sui, Kopi Kay, Sedotan Kopi, and Skala Coffee, the research captured nuanced interactions between technical barriers, power outages and socio-cultural dynamics, cash-based consumer habits, providing a holistic understanding of e-money integration challenges. The framework aimed to develop the lived experiences shape their engagement with e-money and to capture the moving beyond abstract metrics (Creswell & Creswell, 2018; Weyant, 2022). Centering insider perspectives, the study illuminates how coffee shops' vendors in Langsa navigate infrastructural barriers, and socio-cultural norms within Aceh's Islamic context (Creswell, 2010). The framework bridges rural digital divides by highlighting localized narratives often absent in top-down digital economy frameworks, offering culturally grounded insights into systemic challenges. The phenomenology prioritizes depth over statistical generalizability, making it ideal for examining the complex interplay between technical constraints, and socio-cultural factors, i.e., distrust of digital systems due to Gharar, uncertainty in Islamic finance.

The Samples and Instruments

The consumer samples comprised parents, teenagers, and millennials frequenting Langsa coffee shops. Despite vendors' E-Money systems, cash remained dominant due to habit and infrastructure gaps. Millennials, a key demographic, utilized these hubs for social and business activities, yet technical barriers hindered digital payment adoption. The study used semi-structured interviews and participant observation for data collection (Chu, PH. and Chang, 2017; Creswell & Poth, 2018). Interviews, guided by a pre-tested protocol, explored participants' perspectives on e-money adoption, technical barriers (Anwar, 2020), i.e., electricity-internet instability, and alignment

with Islamic principles like zakat and avoidance of Gharar. Open-ended questions, i.e., "*How do power outages affect E-Money use?"*, which encouraged detailed insights. Over 12 weeks, participant observation documented transaction patterns, e-money usage frequency, and infrastructural disruptions. The field notes captured vendors-customer interactions and environmental factors, i.e., electricity availability. Triangulation enhanced validity by cross-verifying interview responses with observed behaviors and contextual conditions.

The Procedure of Data Collection

The study used purposive sampling to select five coffee shops meeting three criteria: active E-Money adoption, diverse customer demographics, and varied proximity to urban centers (Adarkwah & Zeyuan, 2020; Anwar, 2020). Data collection followed ethical guidelines: participants received informed consent forms detailing the study's purpose, anonymity assurances, and voluntary participation. Interviews were conducted face-to-face in Bahasa Indonesia at the shops, lasted 45–60 minutes, and were audio-recorded with consent. Over 12 weeks, researchers conducted participant observation during peak hours (10 a.m.–8 p.m.), documenting E-Money transaction attempts, customer preferences, and technical issues (e.g., connectivity failures). Emerging themes, such as recurring power outages, informed iterative refinements to interview questions, ensuring data remained grounded in participants' lived experiences and contextual realities.

The Procedure of Data Analysis

Data analysis employed thematic analysis to identify patterns across interview transcripts and field notes (Chu, PH. and Chang, 2017; Creswell & Creswell, 2018). The process began with open and axial coding, categorizing data into themes like "*infrastructure barriers*" and "*Shariah alignment*." Four core themes emerged: technical constraints, cultural preferences, policy gaps, and Islamic finance compatibility. The key patterns included distrust in digital systems tied to Gharar (uncertainty), which shaped these themes. To ensure validity, preliminary findings were validated via member checking with three participants, clarifying misinterpretations (e.g., nuances of zakat-linked E-Money systems) through follow-up discussions. This approach strengthened rigor by grounding findings in ASEAN's inclusive finance frameworks and Acehnese socio-religious values, ensuring empirical insights aligned with both theoretical and cultural contexts.

Ethical Considerations

The study followed ethical protocols approved by the IAIN Langsa Research Ethics Committee (Ref: ETH/2024/023), ensuring responsible and culturally sensitive research practices. To protect participants' identities, participants were assigned pseudonyms, and participation was entirely voluntary, with the option to withdraw at any time without consequence. Cultural sensitivity was prioritized by avoiding intrusive questions about personal religious practices, focusing instead on observable economic behaviors related to E-Money usage. To mitigate researcher bias, particularly urban-centric perspectives, the team collaborated with local Acehnese scholars to interpret findings through a culturally grounded lens. While the sample size was limited to five coffee shops in Langsa, potentially constraining generalizability, the study prioritized depth over breadth.

Therefore, the method engaged with its novelty by embedding Islamic finance principles into interview design and analysis, ensuring alignment with Acehnese socio-religious values. Centering participants' voices, its critiqued ASEAN's urban-centric digital policies, exposing gaps in rural inclusivity. Technical barriers like power outages were linked to debates on decentralized infrastructure investments in Muslim-majority regions. Combining qualitative rigor with culturally

rooted insights, the research advances interdisciplinary discourse on equitable digital finance, bridging technological innovation, and Islamic economic ethics in Asia's semi-urban economies. This approach ensures policy recommendations resonate with both empirical realities and Acehnese socio-cultural contexts.

FINDING AND DISCUSSION

The findings reveal a paradox in E-Money adoption among Langsa's coffee shop traders: awareness and implementation coexist with systemic barriers that limit customer uptake . Despite Indonesia's push toward digital economies, cash remains dominant in small retail transactions, particularly among lower-income groups and micro-enterprises. Traders at five Langsa coffee shops, Skala Coffee House, Kopikay Langsa, Sedotan Kopi, Sams Coffee & Roastery, and Kopi Sui, confirmed E-Money adoption, citing benefits such as streamlined accounting, reduced theft risks, and spontaneous promotional flexibility (e.g., cashback discounts). However, customer usage remains minimal, with only 1–5 daily E-Money transactions reported. Traders attributed this to habitual cash dependency, low digital literacy, and infrastructural challenges like unstable electricity and spotty internet, which disrupt transactions. While participants expressed optimism about E-Money's potential to modernize payments, they emphasized the need for decentralized infrastructure investments and Shariah-aligned fintech tools (e.g., *zakat* -linked systems) to build trust. Notably, none of the traders verified customer data formally, relying instead on mutual trust in technology, a practice that raises questions about long-term security and regulatory compliance. These insights underscore the tension between national digital economy policies and localized realities, offering actionable pathways to bridge rural-urban digital divides in Aceh's semi-urban economies.

The Coffee Shop Vendors' Responses to E-Money Transactions in Langsa City

Cash remains the dominant medium for small retail transactions in Indonesia. Despite early adoption of credit-debit cards, e-money awareness remains low among the general population. While upper-class consumers access banking services seamlessly, lower-income groups face systemic barriers. Though e-money could democratize financial access, limited digital literacy and reliance on physical cash persist, particularly among micro-enterprises. Additionally, few small businesses adopt EDC machines, and those that do often lack staff training to operate them effectively. For instances, five coffee shops in Kota Langsa, i.e., the Skala Coffee House, Kopikay Langsa, Sedotan Kopi, Sams Coffee & Roastery, and Kopi Sui, have adopted E-Money systems, with participants confirming implementation.

The first participants, vendors form Coffee House stated that "*Yes, I know the E-Money payment system. In fact, we have it here.*" Similarly, the participants from Sedotan Kopi said, "*We use E-Money, but currently the system is temporarily down.*" The next participants from Sams Coffee & Roastery added, "*Yes, we accept E-Money, even for items as cheap as Rp. 5,000.*" Most participants reported implementing E-Money systems either upon launching their businesses or shortly after. For instance, a participant from Sedotan Kopi explained, "*we introduced E-Money six months after the shop was opened.*" Meanwhile, participants from Kopikay and Skala Coffee House said that they had offered E-Money since their opening days. When asked why they adopted E-Money, many cited practicalities. A participant from Kopi Sui shared, "*It's more practical, no hassle with giving change*". A participant from Sams Coffee & Roastery agreed, "*Just using a card is easier. As long as it's loaded, it works fine. It's convenient for us.*" The participant from Kopikay elaborated, "*Now that everything is modern, the payment system should keep up. Millennials often use E-Money. If all customers paid digitally, we wouldn't need to stock change or worry about theft.*" The participant from Skala Coffee House added, "*It's just easier and less stressful. No need to find small bills for change.*" Despite these benefits, participants

observed that only a small number of customers actually use E-Money. Cash remains the dominant payment method. For example, the participant from Kopi Sui noted, "*Maybe one or two customers per day use E-Money. But I'll keep accepting it.*" Similarly, the participant from Sams Coffee said, "*At most, five customers use it in a day.*" The participant from Skala Coffee House added, "*Mostly young people, sometimes older ones. But I'll always accept it, if it makes things easier, why not?*" The participant from Sedotan Kopi commented, "*It's still minimal, only two or three people per day. But I'll keep it because it really helps*. Accordingly, the participants highlighted several benefits of E-Money adoption. A participant from Sams Coffee explained, "I*t simplifies accounting since everything is recorded digitally.*" A participant from Sedotan Kopi added, "*During busy hours, it's hard to deal with cash. E-Money saves time, especially with giving change.*" The participant from Kopikay remarked, "*It's practical, theft-proof, and stress-free.*" The participant from Kopi Sui echoed, "*We use E-Money because it makes things easier.*"

The findings highlight a disconnect between trader enthusiasm for E-Money and limited customer uptake, underscoring systemic challenges in digital finance adoption. While all five coffee shops, the Skala Coffee House, Kopikay Langsa, Sedotan Kopi, Sams Coffee & Roastery, and Kopi Sui, acknowledged E-Money's practical benefits, such as eliminating cash handling, reducing theft risks, and enabling spontaneous promotions, customer usage remains minimal (1–5 transactions daily). This aligns with broader trends in Indonesia, where cash dependency persists due to low digital literacy, habitual trust in physical money, and infrastructural fragility (Fitri Fadilah Widyaputri & Edy Yusuf Agung Gunanto, 2023; Yager & Pasi, 2001). Traders noted that older and family demographics, alongside millennial customers, still favor cash, reflecting cultural resistance to digital tools in semi-urban economies (Yager & Pasi, 2001). The paradox of high trader adoption but low consumer engagement highlights the need to address infrastructural gaps (e.g., unstable electricity, poor internet) and behavioral barriers (e.g., distrust in digital systems) to bridge rural-urban digital divides.

The Participants also reported that e-money payments eliminate the need to provide large amounts of change and speed up the payment process. Interestingly, none of the coffee shop owners went through formal registration processes for e-money services. They trusted that the customer data used in transactions were secure. For instance, the participant from Skala Coffee said, "*I don't verify their data. I just trust that it's theirs.*" The participant from Sams Coffee added, "*I trust them. It's like in banking, mutual honesty is enough.*" Kopikay's participant said, "*I believe the card belongs to the customer. Today's technology easily detect fraud.*" Kopi Sui's participant affirmed, "*I trust the data is genuine and safe.*" A recurring theme was the technical instability of E-Money systems, exacerbated by power outages and unreliable internet connectivity. Traders reported that system downtime whether due to maintenance, network failures, or electricity cuts, renders E-Money unusable, forcing reliance on cash backups. For instance, a trader from Skala Coffee House stated, "When the electricity goes out, we can't accept E-Money payments," while Kopi Sui's trader emphasized, "Weak network signals or system errors block all transactions." These challenges mirror ASEAN's recognition of rural-urban digital disparities, where semi-urban regions like Langsa face systemic infrastructural neglect. Unlike urban hubs with stable networks, Langsa vendors operate in environments where technical barriers outweigh perceived benefits, stifling e-money adoption despite trader optimism (Habib Asseghaf Herdadi, 2022; McBride & Derevensky, 2009). This underscores the urgency of decentralized infrastructure investments, such as solar-powered systems and subsidized internet, to enable equitable digital finance access in Muslim-majority regions.

One advantage participant particularly appreciated was the absence of administrative fees when withdrawing their sales balance. A participant from Sedotan Kopi explained, "*There are no fees when I withdraw my E-Money sales.*" The participant from Skala Coffee House confirmed, "*No deductions. That's why E-Money is here to stay.*" Moreover, promotional programs like cashback or

discounts also incurred no admin fees. The participant from Kopi Sui noted, "*We design promotions ourselves. Customers are surprised when they pay and see a lower price, it's a nice gesture*." Sams Coffee's participant stated, "*No admin fees. We use it to attract customers, maybe once a week*." Sedotan Kopi's participant added, "*People love discounts. We give lower prices to E-Money users for instance, Rp 18,000 instead of Rp 20,000*." The participant from Kopikay said, "*There's no fee. Sometimes we surprise customers with discounts at checkout—it's spontaneous*." Overall, each coffee shop had some form of promotion tied to E-Money, offered without additional admin costs. These promos were often spontaneous and revealed only during payment, adding an element of surprise for the customer.

Traders expressed unquestioned trust in e-money data security, despite lacking formal verification processes for customer transactions. Statements like "I just trust that it's theirs" (Skala Coffee) and "Today's technology can detect fraud" (Kopikay) reveal a reliance on informal trust over regulatory compliance. While this aligns with Islamic principles of mutual honesty (amanah), it raises concerns about long-term risks, particularly in regions with limited oversight. Bank Indonesia's E-Money regulations emphasize data integrity, yet traders' informal practices, such as unverified card usage, highlight a gap between policy frameworks and grassroots implementation. This tension calls for Shariah-aligned fintech solutions that integrate robust security features (e.g., biometric authentication) while respecting Acehnese socio-religious values. For example, blockchain-enabled zakat tracking or waqf -funded digital literacy programs could build trust in E-Money systems while ensuring compliance with Wadiah (safekeeping) and Qardh (loan) contracts under Islamic law. E-Money's cost-free withdrawal policies and promotional flexibility emerged as key advantages for traders. Participants noted that E-Money eliminates administrative fees, enabling spontaneous discounts (e.g., Rp 18,000 instead of Rp 20,000) to attract customers. This aligns with Indonesia's National Sharia Council (DSN) guidelines, which encourage ethical financial practices that benefit both providers and users. However, the absence of formal promotional frameworks, such as Bank Indonesia's QRIS-linked incentives, limits scalability. Traders' reliance on self-designed promotions (e.g., surprise discounts) reflects a grassroots adaptation of E-Money, but systemic support (e.g., government-subsidized cashback programs) could amplify adoption. By integrating Shariah-compliant incentives (e.g., zakat -linked rebates), policymakers could align E-Money with Acehnese cultural norms while addressing trader concerns about transactional efficiency.

The study reveals a critical mismatch between national digital economy policies (e.g., Bank Indonesia's QRIS mandates) and localized realities in semi-urban Aceh. Traders criticized urban-centric infrastructure investments, noting that "the government talks about cashless systems but doesn't fix our electricity problems" (Skala Coffee). This echoes critiques of ASEAN's inclusive finance frameworks, which often overlook rural-specific challenges. The participants shared their hopes for wider E-Money adoption. A participant from Sams Coffee expressed, "*Let's start using E-Money, it's safer and saves us the hassle of preparing change*." Skala Coffee's participant said, "*I hope more customers start using it. It's safer and more efficient than carrying cash. Sometimes I find small bills left behind, E-Money solves that*." Sedotan Kopi's participant echoed, "*I hope more people use it, it's practical and time-saving*." Kopi Sui's participant humorously added, "*Why keep up with fashion but not with digital wallets*?" The participants research notes that e-money is an outcome of national economic policy aimed at reducing physical cash circulation to help control inflation through Bank Indonesia. E-money modernizes the payment system into something safe, convenient, and widely adopted internationally. According to Jefry, Indonesia's National Sharia Council (DSN) has developed regulations to ensure that e-money complies with Islamic principles. E-money deposits are not classified as bank savings. When users deposit money with e-money providers, two types of contracts apply, *Wadiah* (safekeeping) and *Qardh* (loan). A *Wadiah* contract shift to *Qardh* if the provider uses the funds with the customer's permission.

In conclusion, the interviews with coffee shop participants in Kota Langsa revealed a strong awareness and acceptance of e-money systems. Although customer usage remains limited, participants recognize numerous benefits, including convenience, efficiency, and security, and are optimistic about broader adoption in the future.

The Barriers to E-Money Adoption in Coffee Shop Transactions

E-Money payment systems offer convenience for both traders and customers by eliminating the need for exact change or holding physical cash, thereby reducing the risk of errors during transactions. However, despite these advantages, users must carefully select E-Money products that suit their needs. According to research by Ni Made Dwi Aksami and I Made Jember, income, perceived benefits, ease of use, and security factors significantly influence the intention to use E-Money services, both collectively and individually.

One of the main challenges in using E-Money is its reliance on internet connectivity. Users often face unstable connections, sudden data outages, system errors during app maintenance, or forgotten passwords. If many customers use E-Money, employees may also struggle to manage electronic balances or transactions. Additionally, there is still a limited number of merchants with EDC devices, and no single E-Money card currently supports all types of transactions. A trader from Skala Coffee House explained: "*There are definitely challenges, like power outages. When the electricity goes out, we can't accept E-Money payments. And when the network is slow, that's the worst. We rely on the café's Wi-Fi, so if the signal is weak, it really disrupts everything*" The findings underscore that technical challenges, unstable internet, power outages, and system errors, are the primary obstacles to E-Money adoption in Langsa coffee shops. Traders consistently emphasized that while E-Money systems are easy to register and use, their reliability hinges on infrastructural stability, which remains lacking in semi-urban Aceh. For instance, power outages render E-Money systems entirely inoperable, forcing traders to revert to cash transactions. As noted by a trader from Skala Coffee House, "When the electricity goes out, we can't accept E-Money payments", highlighting how energy instability disrupts digital finance integration. Similarly, weak Wi-Fi signals and network failures during peak hours ("the worst" scenario, per Kopi Sui's trader) exacerbate transaction delays, undermining customer confidence. These issues align with broader critiques of Indonesia's urban-centric digital economy policies, which neglect rural and semi-urban regions like Langsa, where systemic infrastructural gaps outweigh perceived benefits of E-Money. Unlike urban hubs with robust networks, Langsa traders operate in environments where technical disruptions are routine, stifling adoption despite trader enthusiasm.

A recurring theme is the overwhelming dependence on stable internet connectivity, a luxury often unavailable in Langsa. Traders from Kopikay and Sedotan Kopi acknowledged that while E-Money interfaces are user-friendly ("*no difficulties with registration*"), transaction failures due to poor network signals or app maintenance frequently derail operations. This aligns with Ni Made Dwi Aksami and I Made Jember's findings that perceived ease of use and security significantly influence E-Money adoption. However, in Langsa's context, these factors are undermined by technical limitations beyond traders' control. For example, Sams Coffee & Roastery's trader noted, "when the app is under maintenance, it just doesn't work", exposing the vulnerability of centralized fintech systems to localized disruptions. The absence of offline transaction capabilities, a feature common in traditional cash systems, further erodes trust in E-Money, particularly among older customers who prioritize reliability over convenience. This highlights a critical gap in ASEAN's inclusive finance frameworks, which often assume universal access to stable digital infrastructure, overlooking semi-urban realities where technological risks outweigh behavioral incentives.

A trader from Kopikay shared "*There's nothing difficult, especially with clear instructions to follow. The only issue is the internet connection, you really need a strong network for E-Money.*" A trader from Sedotan

Kopi noted: "*So far, no difficulties, everything has been smooth in terms of registration and identity verification. But sometimes there are transaction failures due to poor network connections*." The trader from Sams Coffee & Roastery added "*No real difficulties, accessing it is very easy. But the main issue is when the network is unstable or the app is under maintenance. At those times, it just doesn't work*." Finally, a trader from Kopi Sui said: "*There's nothing difficult about registering or validating data. The main problem is just weak network signals or occasional system errors*." Based on these responses, it's clear that traders in Kota Langsa generally do not struggle with registration or account verification when using E-Money.

The study reveals a stark misalignment between national digital economy policies i.e., Bank Indonesia's QRIS mandates and localized infrastructural realities (Gea & Al-Azhar, 2021; Listiana & Edriyanti, 2023). Traders criticized the lack of government investment in rural energy and internet access, with one noting, "the government talks about cashless systems but doesn't fix our electricity problems". This echo broader critiques of ASEAN's digital finance strategies, which prioritize urban hubs while neglecting semi-urban and rural economies. To address this, the research advocates for decentralized infrastructure investments, such as solar-powered E-Money systems and subsidized rural internet access, to reduce dependency on centralized grids. Additionally, fintech providers could develop hybrid payment models that allow limited offline transactions during outages, ensuring continuity without compromising security. By integrating these solutions, policymakers could bridge rural-urban digital divides while aligning with The Suluq Economics' mission to reconcile technological innovation with socio-religious values in Muslim-majority regions. However, the vendors face technical challenges that significantly impact the system's usability. The most critical issues include power outages, which render the E-Money system completely offline, and unstable internet connections, which can block all transactions. When the system is down, neither traders nor customers can use E-Money for payments. These disruptions highlight the technological risks of relying on electronic payment systems, including server errors and electricity failures. During such conditions, E-Money becomes entirely unusable, creating barriers for both parties in the transaction process.

Therefore, the technical barriers faced by Langsa traders also highlight opportunities to embed Islamic finance principles into fintech design. For instance, the unpredictability of E-Money systems, linked to Gharar (uncertainty) under Shariah law, could be mitigated through blockchain-enabled transparency or waqf -funded infrastructure projects to stabilize internet and electricity access.

CONCLUSION

This study reveals that while coffee shop traders in Langsa City, Aceh, demonstrate awareness and willingness to adopt E-Money systems, systemic infrastructural and cultural barriers, unstable electricity, unreliable internet, and habitual cash dependency, hinder effective implementation. Traders recognize E-Money's benefits, including operational efficiency, theft prevention, and spontaneous promotional flexibility, yet customer usage remains minimal (1–5 daily transactions). These findings align with the study's objectives, underscoring the mismatch between national digital economy policies and localized semi-urban realities. To bridge rural-urban digital divides, the research recommends decentralized infrastructure investments to stabilize electricity and internet access, alongside Shariah-aligned fintech innovations (e.g., zakat -linked E-Money systems) to build trust among Muslim-majority communities. Policymakers must prioritize grassroots engagement, integrating trader and consumer feedback into ASEAN's inclusive finance frameworks to ensure technological modernization aligns with Acehnese socio-religious values. The study's limitations include a small sample size (five coffee shops) and geographic focus on Langsa, limiting generalizability. Future research should expand to other sectors and regions to validate findings. Additionally, exploring hybrid payment models, combining E-Money with offline

transaction capabilities, could address technical disruptions. Centering Acehnese micro-businesses, this research advances economics mission to reconcile technological innovation with ethical governance. It calls for ASEAN-wide reforms that prioritize rural digital equity, ensuring fintech adoption aligns with both infrastructural needs and Islamic economic principles. Ultimately, equitable E-Money integration in semi-urban economies requires policies that transcend urban-centric frameworks, embracing localized solutions rooted in community trust and cultural relevance.

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