

## Determinants of Islamic Digital Banking Adoption under Sharia Regulatory Mandate: Evidence from Aceh, Indonesia

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### Abstract

This study investigates the socio-technical determinants of Islamic digital banking adoption under the unique framework of Aceh's Sharia Financial Institutions Qanun (Qanun LKS). While this mandate achieved 100% administrative migration, its impact on substantive digital behavior remains under-explored. This research addresses the "Adoption Paradox" where high legal inclusion fails to trigger active usage. A quantitative descriptive-analytical design was employed, surveying 200 Bank Syariah Indonesia (BSI) customers in Bireuen Regency, a semi-rural district, to capture digital transition challenges in a traditional society. Data were analyzed using Multiple Linear Regression in SPSS 21. Findings reveal a significant adoption gap, with only 30% of respondents classified as active users. Regression results indicate that Digital Literacy is the strongest predictor ( $\beta = 0.600$ ;  $p < 0.001$ ), followed by Trust in Security ( $\beta = 0.462$ ;  $p < 0.001$ ), perceived ease of use, and social influence. The study concludes that top-down legal mandates are insufficient without bottom-up interventions in digital capability and trust-building. To achieve the Cost Optimization Rate (COR), Islamic financial institutions must prioritize cybersecurity and literacy programs to bridge the adoption gap. This research contributes by linking region-specific Sharia mandates with technology acceptance models, offering a scalable framework for digital transformation in Sharia-governed economies.

**Keywords:** Adoption Paradox, Digital Banking Adoption, Digital Literacy, Qanun LKS, Trust.

### Introduction

The global financial landscape is currently undergoing a paradigm shift driven by the rapid acceleration of digital technology. In the Islamic financial sector, digitalization is no longer a peripheral option but a core strategic necessity to ensure institutional sustainability and competitiveness. Digital banking platforms, particularly mobile-based services, offer unprecedented opportunities to enhance operational efficiency, reduce transaction costs, and bridge the financial inclusion gap in underserved Muslim populations. From a managerial perspective, this transition is closely linked to Cost Optimization strategies. By migrating traditional branch-based transactions to digital interfaces, Sharia-compliant banks can significantly lower overhead expenses and reallocate resources toward product innovation and customer empowerment. However, despite the clear economic benefits, the global adoption of Islamic digital banking remains heterogeneous, influenced by a complex interplay of technological readiness, cultural perceptions, and regulatory environments.

In the Indonesian context, the province of Aceh stands as a pioneering jurisdiction through its "Grand Experiment" in Sharia financial governance. The enactment of Aceh Qanun No. 11 of 2018 on Sharia Financial Institutions (Qanun LKS) represents a radical institutional shift, mandating that every financial entity within the province operate under Sharia principles. This regulatory intervention led to a massive structural transformation, including the total withdrawal of conventional banking systems and the consolidation of state-owned Sharia banks into Bank Syariah Indonesia (BSI) in 2021. Unlike other regions where Sharia banking

grows through market competition, Aceh's transformation is driven by a "top-down" legal mandate. This unique regulatory landscape creates a "forced adoption" environment where customers are administratively required to use Sharia-compliant services, regardless of their prior technological familiarity or institutional loyalty.

Empirical evidence supports this condition. According to data from Bank Indonesia and the Financial Services Authority (OJK), mobile banking transactions in Indonesia have increased by more than 30% annually in recent years. Nevertheless, the growth of digital banking is not evenly distributed across regions. In Aceh, although the implementation of Qanun LKS has increased the number of Bank Syariah Indonesia (BSI) customers significantly, the proportion of active BSI Mobile users remains relatively low, particularly in semi-rural areas such as Bireuen Regency. Furthermore, reports from the Ministry of Communication and Information Technology show that the digital literacy level of Indonesian society is still moderate, with rural and semi-rural communities lagging behind urban populations. In Bireuen, limited digital literacy, infrastructure constraints, and socio-cultural characteristics have become major barriers to the effective use of mobile banking services.

Despite the robust legal framework and the availability of sophisticated digital tools like BSI Mobile, a significant "Adoption Paradox" has emerged. In Bireuen Regency, a region characterized by its strong traditional religious values and a semi-rural economic structure, the enforcement of Qanun LKS has not been met with a proportional surge in active digital engagement. While the majority of the population are now BSI customers by law, a substantial portion remains "analog" in their banking behavior, preferring physical branch visits over mobile transactions. This discrepancy highlights a critical gap: administrative compliance does not equate to behavioral adoption. The reliance on physical services in a mandatory Sharia system inadvertently increases the bank's operational costs and limits the potential for inclusive digital growth, thereby challenging the very essence of the Cost Optimization Rate objectives within the Sharia financial program.

The failure of a legal mandate to drive digital behavior necessitates a deeper exploration of socio-technical determinants. According to the Technology Acceptance Model (TAM), perceived ease of use and usefulness are vital, but in a Sharia-mandated context, these factors must be augmented with Digital Literacy and Institutional Trust. In Bireuen, digital literacy serves as a foundational barrier; without the cognitive capability to navigate digital interfaces, users perceive the technology as a burden rather than a benefit. Furthermore, Trust in Islamic banking is multidimensional, encompassing both technical cybersecurity and religious compliance (Sharia legitimacy). Any systemic instability or perceived lack of transparency can trigger a "trust deficit," causing users to revert to traditional, cash-based methods to protect their wealth (Hifdz al-Maal). Social influence, mediated by community leaders and peers, also plays a pivotal role in shaping the collective acceptance of new financial technologies in traditional societies.

While existing literature has extensively examined digital banking adoption in urban or voluntary settings, there is a profound lack of empirical research focusing on adoption determinants under a mandatory Sharia legal framework in semi-rural areas. Most studies focus on either the legal aspects of Qanun LKS or general technology acceptance, rarely bridging the two. This study fills this critical gap by investigating the socio-technical drivers of BSI Mobile adoption in Bireuen Regency. By linking individual behavioral factors to the broader institutional mandate of Aceh's Sharia transformation, this research provides a scalable framework for understanding how legal enforcement interacts with user readiness. The findings offer strategic implications for the government and Sharia banks to move beyond "legalism" toward a "holistic empowerment" strategy, ensuring that the digital transformation of Islamic finance is not only mandatory but also inclusive and efficient.

## Literature Review

### The Evolution of Technology Acceptance Models: From TAM to UTAUT2

The theoretical foundation of this study is rooted in the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2), which represents an evolution of the classical Technology Acceptance Model (TAM). While TAM focuses on Perceived Ease of Use (PEOU) and Perceived Usefulness (PU), UTAUT2 introduces critical dimensions such as Facilitating Conditions and Price Value, which are highly relevant in a semi-rural context like Bireuen (Denopan, 2025). In the Islamic banking sector, "usefulness" is redefined as the ability to fulfill Sharia-compliant financial needs efficiently. Recent literature suggests that in regions under Sharia mandates, the traditional TAM model is insufficient because it ignores the "Religious Compatibility" factor—the degree to which a technology aligns with the user's religious identity and values (Ichsan et al., 2024; Nur et al., 2024)..

### Institutional Theory and Regulatory Compliance: The "Aceh Experiment"

The implementation of Qanun LKS No. 11 of 2018 is a prime example of Regulatory Institutionalism. Institutional theory, specifically the concept of Coercive Isomorphism, explains how organizations and individuals are compelled to adopt certain behaviors due to legal mandates (Siska, 2022). In Aceh, this mandate created a sudden "institutional vacuum" when conventional banks exited, forcing a rapid migration to Bank Syariah Indonesia (BSI). However, Pradana et al. (2024) observe that coercive pressure often leads to "Symbolic Compliance" rather than "Substantive Adoption." While the people of Bireuen comply with the law by opening BSI accounts, their substantive adoption of digital services (BSI Mobile) remains low because the legal mandate does not address the underlying socio-technical readiness (Masyita Auliyah & Andriani Samsuri, 2025).

### Digital Literacy: The Cognitive Gateway to Inclusion

Digital literacy in this study is conceptualized as a multi-dimensional construct involving technical, cognitive, and ethical-social skills. In the context of the Socio-Technical Systems (STS) approach, digital literacy is the "social subsystem" that must be optimized alongside the "technical subsystem" (the BSI Mobile app). In rural or semi-rural areas like Bireuen, digital literacy acts as a mediator between regulatory pressure and actual usage (Pajaria, 2025). Without literacy, users experience high "Perceived Risk," fearing that one wrong click could result in financial loss. Therefore, digital literacy is not merely a skill but a prerequisite for the Cost Optimization of banking services; literate users reduce the bank's operational burden by shifting transactions from high-cost teller services to zero-marginal-cost digital channels (Ningsih, 2025; Nurafifah et al., 2025).

### Trust and Cybersecurity in Islamic Financial Institutions

Trust in Sharia digital banking is built upon two pillars: System Integrity and Sharia Legitimacy. System Integrity refers to the technical robustness against cyber-attacks, while Sharia Legitimacy refers to the assurance that the digital algorithms used in financing and profit-sharing adhere to Islamic principles (Badawi, 2025). Pasca-merger dynamics of BSI have placed institutional trust at the forefront of the adoption debate. Dwi Nurrizkiana & Alrasyid (2025) argue that for Acehese users, trust is a form of Social Capital. When a system experiences downtime, it is perceived not just as a technical failure but as a breach of Amanah (trust). Within the Maqasid Shariah framework, the preservation of wealth (Hifdz al-Maal) is paramount, making trust the primary psychological filter through which all digital banking adoptions must pass.

### Social Influence and the Mediation of Religious Leadership

In traditional Acehese society, the Subjective Norm (the perceived social pressure to perform or not perform a behavior) is heavily influenced by religious and community leaders. Social influence in Bireuen operates through Collectivist Dynamics, where the adoption of BSI Mobile is often a communal rather than a purely individual decision (Ramdani et al., 2025). If

religious leaders (Ulama) frame digital banking as a tool for "Sharia Economic Jihad" or modern Muamalah efficiency, adoption intention increases significantly. Conversely, negative social influence stemming from cybersecurity fears can rapidly lead to mass avoidance (Farida Ayu Avisena Nusantari et al., 2025). This highlights the importance of social influence as a "Soft Infrastructure" that must support the "Hard Infrastructure" of the Sharia mandate.

### **Conceptual Framework and Hypothesis Development**

The conceptual framework of this study integrates the Technology Acceptance Model (TAM) with the Socio-Technical Systems (STS) theory, specifically adapted to the mandatory Sharia financial environment in Aceh. The model posits that the adoption of BSI Mobile is not a singular event but a result of the interaction between individual capability (Digital Literacy), psychological assurance (Trust), system usability (Perceived Ease of Use), and communal pressure (Social Influence).

#### **The Critical Role of Digital Literacy (H1)**

Digital literacy serves as the fundamental human capital required to navigate the digital finance ecosystem. In a semi-rural setting like Bireuen, where the transition from conventional to Sharia banking was mandated by Qanun LKS, digital literacy acts as a "cognitive gateway." Without the ability to understand digital interfaces, authorization protocols, and security features, users experience high cognitive load and anxiety. Higher digital literacy reduces the perceived complexity of the application, allowing users to move from administrative compliance to active digital engagement. This aligns with the "Protection of Intellect" (Hifdz al-'Aql) in Maqasid Shariah, where knowledge empowers individuals to manage their financial affairs effectively.

- H1: Digital literacy has a positive and significant effect on the adoption of BSI Mobile.

#### **Institutional Trust and Wealth Protection (H2)**

In Islamic banking, trust (Amanah) is a multidimensional construct encompassing technical reliability and ethical-religious compliance. Pasca-merger dynamics and systemic instabilities in Sharia banks have heightened users' sensitivity toward security. Trust acts as a risk-reduction mechanism; when users believe that BSI Mobile is secure from cyber threats and operates according to Sharia principles, their perceived risk decreases. This is fundamentally linked to the "Protection of Wealth" (Hifdz al-Maal), as users will only adopt digital tools if they are certain their assets are safe from both technical fraud and non-Sharia practices.

- H2: Trust in application security has a positive and significant effect on the adoption of BSI Mobile.

#### **Perceived Ease of Use and Effort Optimization (H3)**

Perceived Ease of Use (PEOU) refers to the degree to which a person believes that using a particular system would be free of effort. For the traditional community in Bireuen, an intuitive interface is crucial. If the BSI Mobile application is perceived as user-friendly and easy to navigate, it minimizes the psychological barrier to switching from branch-based transactions to digital ones. From an economic perspective, ease of use is a component of Cost Optimization, as it reduces the "time cost" for the user and the "service cost" for the bank.

- H3: Perceived ease of use has a positive and significant effect on the adoption of BSI Mobile.

#### **Social Influence and Communal Legitimacy (H4)**

In a collectivist society like Aceh, individual decisions are often mediated by the opinions of significant others, including family, peers, and religious leaders (Ulama). Social influence provides "normative legitimacy" to technology. If the community perceives that using BSI Mobile is a social norm or is encouraged by respected figures as a way to support the "Sharia Economy Jihad," the likelihood of adoption increases. Social influence helps overcome individual hesitation by providing a collective sense of security and religious approval.

- H4: Social influence has a positive and significant effect on the adoption of BSI Mobile.

## Research Method

### Research Paradigm and Design

This study is fundamentally grounded in the positivist paradigm, which perceives social reality as an objective phenomenon that is measurable and generalizable through rigorous scientific procedures. The adoption of this paradigm aims to empirically validate the hypothesized relationships between variables. Through a quantitative approach, the researcher seeks to minimize subjectivity by transforming customer perceptions into numerical data processed through statistical instruments, thereby ensuring the findings are "value-free," accurate, and reproducible.

The research utilizes a descriptive-analytical design. The descriptive component of this study is directed toward profiling the demographic characteristics of Bank Syariah Indonesia (BSI) customers in Bireuen Regency and providing a general overview of digital feature adoption rates following the implementation of the Sharia Financial Institutions Qanun (Qanun LKS). Conversely, the analytical (explanatory) component is applied to examine the profound influence of exogenous variables namely digital literacy, trust, perceived ease of use, and social influence on the endogenous variable, which is the adoption of Sharia digital banking. The selection of this design is highly relevant given that the banking ecosystem in Aceh currently operates under a "Regulatory Mandate" framework. In this context, the transition of customers from conventional to Sharia-compliant banking is legally compulsory. Consequently, this research moves beyond merely measuring "interest" or "intent" to use; it delves into the behavioral determinants within an environment of institutional pressure. By integrating the Socio-Technical Systems (STS) and Institutional Theory frameworks, this design bridges the gap between the technical aspects of the application and the socio-psychological state of the users. The outcomes of this descriptive-analytical design are expected to provide robust statistical generalizations that are not only applicable to the Bireuen community but can also serve as a reference for other jurisdictions undergoing similar financial system transitions.

Operationally, this research design follows a systematic deductive logic. It begins with identifying the "adoption gap" in the field, progresses to the formulation of hypotheses derived from established technology acceptance models, and culminates in empirical verification using multiple linear regression techniques. This rigorous approach ensures that every finding maintains high internal validity and methodological accountability.

### Study Site and Contextual Detail

The research was strategically conducted in Bireuen Regency, a pivotal administrative and cultural district within the Province of Aceh, Indonesia. The selection of Bireuen as the focal point of this study is grounded in several critical considerations that reflect the broader challenges of digital transformation in Sharia-governed economies. Geographically and economically, Bireuen represents a semi-rural landscape where the economy is driven by a mix of traditional agriculture, small-to-medium enterprises (SMEs), and a growing service sector. This transitional economic structure provides an ideal laboratory to observe how a traditional society navigates the abrupt shift from conventional banking to a digital-based Sharia financial system.

Culturally, Bireuen is profoundly recognized as a "Kota Santri" (City of Students), characterized by a high density of Islamic boarding schools (Dayah) and a social fabric deeply interwoven with Islamic values. This high level of religiosity creates a unique behavioral environment: while there is a strong normative commitment to the "Sharia Mandate" (compliance with religious law), it often contrasts with the practical realities of technological readiness. The enactment of Aceh Qanun No. 11 of 2018 regarding Sharia Financial Institutions (Qanun LKS) has mandated a total institutional overhaul, forcing a massive

migration of customers to Bank Syariah Indonesia (BSI). In Bireuen, this transition has achieved high administrative compliance, as residents have no other legal alternative for banking; however, the substantive adoption of digital tools like BSI Mobile remains hindered by significant socio-technical barriers.

Contextually, the "Aceh Experiment" in Bireuen faces a dual challenge. First, digital infrastructure in semi-rural areas often lacks the stability found in urban centers, leading to intermittent connectivity that diminishes user trust in mobile banking. Second, the cultural-digital divide persists, where traditional users—who are accustomed to physical, face-to-face interactions at bank branches—perceive digital interfaces as complex and emotionally detached. By focusing on Bireuen, this study captures the nuances of this "Adoption Paradox," where the legal push for Sharia banking meets the reality of rural digital literacy. This site-specific context is essential for understanding whether the digital transformation is truly inclusive or if it inadvertently creates financial exclusion for those at the intersection of mandatory compliance and technological unfamiliarity.

### **Population and Sampling Strategy**

The population for this study encompasses all customers of Bank Syariah Indonesia (BSI) residing within the administrative boundaries of Bireuen Regency. Given that BSI serves as the primary financial institution in the province following the consolidation of Sharia banks, the population is substantial and inherently diverse. However, to ensure that the data collected provides meaningful insights into digital adoption behavior, this research utilizes a non-probability sampling approach, specifically Purposive Sampling. This method was selected to ensure that the participants possess specific characteristics necessary to answer the research questions, moving beyond mere bank account ownership to actual engagement with digital platforms.

The determination of the sample size was guided by the Cochran Formula for large or unknown populations, as well as the Roscoe Rule of Thumb, which suggests that in multivariate research (such as multiple linear regression), a sample size between 100 and 500 is statistically sufficient to achieve a stable power of analysis. Consequently, a target sample of 200 respondents was established. This number is considered optimal to provide a balance between logistical feasibility in a semi-rural setting and the statistical requirement to minimize the standard error.

The inclusion criteria for the respondents were strictly defined as follows:

1. **Legal Residency:** Respondents must be residents of Bireuen Regency to ensure they are directly affected by the regional socio-economic dynamics and the local implementation of Qanun LKS.
2. **Technological Access:** Respondents must own a smartphone with the BSI Mobile application installed, ensuring they have the fundamental infrastructure required for digital adoption.
3. **Usage Experience:** The sample includes both "active users" and "registered but inactive users" to capture a full spectrum of adoption intensity and the barriers that prevent regular usage.
4. **Maturity:** Respondents must be at least 18 years of age to ensure they have the legal capacity and cognitive maturity to manage their own financial transactions independently.

During the data collection phase, a total of 215 questionnaires were initially gathered. However, to maintain high data integrity, a rigorous Data Cleaning and Screening process was performed. This involved identifying "straight-lining" responses (where respondents provide identical answers for every item regardless of the question) and incomplete submissions. After this filtration, 200 valid responses were retained for the final analysis. This meticulous

approach to sampling ensures that the findings are not only statistically robust but also reflective of the authentic behavioral patterns of BSI customers in Bireuen.

**Operationalization of Variables and Measurement**

To ensure empirical precision and methodological transparency, each theoretical construct in this study was operationalized into specific, measurable indicators. The process of operationalization is critical in quantitative research as it bridges abstract theoretical concepts with observable data collection instruments. In this study, all variables were assessed using a 5-Point Likert Scale, designed to capture the intensity of respondents' perceptions: (1) Strongly Disagree, (2) Disagree, (3) Neutral, (4) Agree, and (5) Strongly Agree.

The variables are categorized into four exogenous (independent) variables and one endogenous (dependent) variable. The selection of indicators is derived from established literature in technology adoption (TAM and UTAUT) and adapted to the specific socio-religious context of the Sharia Financial Institutions Qanun in Aceh.

Variable	Operational Definition	Indicators	Measurement Items (Questionnaire)
Digital literacy ( $X_1$ )	The cognitive and technical proficiency of customers in utilizing digital banking features effectively and securely.	<ol style="list-style-type: none"> <li>1. Technical Proficiency</li> <li>2. Security Awareness</li> <li>3. Operational Independence</li> </ol>	<ul style="list-style-type: none"> <li>• I am proficient in navigating all menus within the BSI Mobile app.</li> <li>• I understand the risks of sharing PIN/OTP codes with others.               <ul style="list-style-type: none"> <li>• I can complete transactions without assistance from bank staff.</li> </ul> </li> </ul>
Trust in Security ( $X_2$ )	The customer's confidence that the bank can protect financial assets and ensure the integrity of personal data in a digital system.	<ol style="list-style-type: none"> <li>1. Data Privacy</li> <li>2. Transaction Integrity</li> <li>3. System Reliability</li> </ol>	<ul style="list-style-type: none"> <li>• I trust BSI to maintain the confidentiality of my personal data.</li> <li>• I am confident that my digital transactions will not be manipulated by the system.</li> <li>• I feel secure because the application system rarely experiences downtime</li> </ul>
Perceived Ease of Use ( $X_3$ )	The extent to which a customer believes that using BSI Mobile will be free of excessive mental or physical effort.	<ol style="list-style-type: none"> <li>1. Menu Intuitiveness</li> <li>2. Instruction Clarity</li> <li>3. Navigational Efficiency</li> </ol>	<ul style="list-style-type: none"> <li>• The menu layout in the application is very easy to understand.               <ul style="list-style-type: none"> <li>• The language and instructions in the app are clear and not confusing.</li> </ul> </li> <li>• It did not take me long to learn how to use this application.</li> </ul>



<p>Social Influence (X<sub>4</sub>)</p>	<p>The degree to which an individual perceives that important others (family, peers, or leaders) believe they should use the technology.</p>	<ol style="list-style-type: none"> <li>1. Peer/Family Influence</li> <li>2. Religious/Community Influence</li> <li>3. Social Prestige</li> </ol>	<ul style="list-style-type: none"> <li>• My family and friends suggested that I use BSI Mobile.</li> <li>• Encouragement from Teungku (Religious Leaders) in Bireuen motivates me to use this app.</li> <li>• Using a mobile banking app makes me appear more modern/prestigious</li> </ul>
<p>BSI Mobile Adoption (Y)</p>	<p>The behavioral intensity of customers in utilizing digital banking services on a consistent and sustainable basis.</p>	<ol style="list-style-type: none"> <li>1. Usage Frequency</li> <li>2. Feature Diversity</li> <li>3. Continuance Intention</li> </ol>	<ul style="list-style-type: none"> <li>• I have frequently used BSI Mobile over the past month.</li> <li>• I utilize various features (Transfers, QRIS, Ziswaf) within the app.</li> <li>• I intend to continue using BSI Mobile as my primary transaction channel.</li> </ul>

To facilitate rigorous empirical testing, the research constructs were operationalized into specific, measurable indicators derived from established socio-technical and technology acceptance theories. Each variable was measured using a Five-Point Likert Scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), to capture the nuance and intensity of respondent perceptions.

1. Digital Literacy (X<sub>1</sub>): This construct evaluates the cognitive and technical readiness of the user. It is measured through respondents' self-reported proficiency in navigating digital financial interfaces, their awareness of cybersecurity protocols (such as OTP and PIN protection), and their perceived ability to execute complex financial transactions independently without external assistance.
2. Trust in Application Security (X<sub>2</sub>): This variable addresses the perceived reliability of the technological infrastructure. It is operationalized through indicators of data privacy protection, transaction integrity, and the institutional reliability of the platform, especially in the context of maintaining Amanah (integrity) within a Sharia financial framework.
3. Perceived Ease of Use (X<sub>3</sub>): This focuses on the user-friendliness of the BSI Mobile interface. Measurement includes assessing the intuitiveness of the user interface, the clarity of instructional cues provided by the app, and the perceived mental effort or simplicity required to complete routine banking tasks.
4. Social Influence (X<sub>4</sub>): This captures the impact of "subjective norms" and communal validation in Bireuen's collective society. It measures the influence of recommendations from family and peers, as well as the critical endorsement of community or religious leaders (Ulama), which serves as a moral and social compass for technology adoption.
5. BSI Mobile Adoption (Y): Rather than a binary measure (use/non-use), this is operationalized as a behavioral usage construct. It reflects the frequency of application

use, the variety of digital features utilized (e.g., Ziswaf, QRIS, transfers), and the customer's intention for continued long-term usage.

### **Data Collection Instruments and Quality Control**

Primary data were gathered using a structured questionnaire as the main research instrument. The distribution followed a hybrid channel strategy (both online via digital forms and offline through physical intercept surveys) to ensure an inclusive representation of Bireuen's semi-rural population, which may have varying levels of digital access and connectivity.

To ensure the scientific integrity of the instrument, two rigorous quality control tests were performed:

1. **Validity Testing:** Conducted using Factor Loading Analysis within a pilot study framework. Each measurement item was scrutinized to ensure it accurately represented its respective construct. Items were deemed valid if their loading factors exceeded the standard threshold of 0.50.

2. **Reliability Testing:** To ensure internal consistency and stability of the instrument over time, Cronbach's Alpha coefficients were calculated. All scales were required to meet a minimum threshold of > 0.70 to be considered reliable for further inferential analysis.

### **Statistical Analysis and Econometric Model**

The data analysis was performed using SPSS (Statistical Package for the Social Sciences) version 21. The analytical framework employed Multiple Linear Regression Analysis to examine the simultaneous and individual effects of the independent variables on the degree of digital banking adoption. This method allows the study to estimate the predictive power of the model and identify which factor most significantly drives adoption in Bireuen.

The research model is expressed in the following econometric equation:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e$$

Where:

- Y = BSI Mobile Adoption
- $\alpha$  = Constant (the intercept)
- $\beta_1 \dots 4$  = Regression coefficients representing the strength of each predictor
- X1 = Digital Literacy
- X2 = Trust in Security
- X3 = Perceived Ease of Use
- X4 = Social Influence
- e = Error term (capturing variables not included in the model)

### **Ethical Considerations and Research Limitations**

This study strictly adheres to established ethical research principles. Informed consent was obtained from every respondent prior to their participation, ensuring they were fully aware of the study's purpose and their right to withdraw at any time. Participation was entirely voluntary, and all personal data were treated with the utmost confidentiality, utilized exclusively for academic purposes.

Furthermore, certain limitations of the study must be acknowledged. First, the use of purposive sampling within a single regency (Bireuen) may limit the generalizability (external validity) of the findings to more metropolitan or diverse urban contexts. Second, the cross-sectional nature of the data captures adoption behavior at a single point in time, providing a "snapshot" rather than a long-term trend. Consequently, the study suggests the need for future longitudinal research to track behavioral shifts as the implementation of the Qanun LKS matures over several years.

## RESULTS AND DISCUSSION

### Respondent Demographic Profile: The Socio-Digital Stratification

The demographic landscape of Bireuen provides a crucial lens through which the "Adoption Paradox" must be viewed. The analysis of 200 respondents reveals that digital banking behavior is not uniform; it is heavily stratified by age and occupation, reflecting a "Digital Divide" within the mandatory Sharia ecosystem.

**Tabel 2. Granular Demographic Analysis (N=200)**

Dimension	Category	Frequency	Percentage	Mean Adoption Score
Age Group	18 – 25 years	65	32.5 %	3.65 (
	26 – 40 years	85	42.5 %	3.10 (Moderate)
	>40 years	50	25 %	1.80 (Low)
Education	High School	40	20 %	2.10 (Low)
	Bachelor's Degree	135	67.5 %	3.25 (Moderate)
	Postgraduate	25	12.5 %	3.55 (High)

Extended Socio-Digital Analysis: The Age-Adoption Correlation reveals a "Resistant Generation" among users over 40. In Bireuen, this group often holds significant liquid assets, yet they exhibit the lowest digital engagement (1.80). This creates a structural inefficiency: the demographic with the highest transaction potential is the one most likely to bypass digital tools in favor of physical branch visits. Furthermore, the moderate adoption scores among Bachelor's degree holders indicate that formal education does not guarantee digital financial literacy. This is a critical finding for Bank Syariah Indonesia (BSI); high academic attainment does not automatically mitigate the "Cognitive Fear" associated with mobile algorithms.

### Descriptive Findings: Assessing "Substantive" vs. "Symbolic" Adoption

In the context of the Aceh Qanun mandate, account ownership is forced compliance, not a measure of technological success. The descriptive data shows that BSI Mobile is currently treated as a "Digital ATM Card" rather than a comprehensive banking solution.

1. Transactional Stagnation: 92% of respondents use the app solely for "Balance Inquiries."
2. Feature Avoidance: Complex Sharia-specific features like Ziswaf (12%) and Gold Investment (2%) remain largely untouched.

This behavior suggests that the community still views digital banking through a low-trust, high-utility lens. They utilize the app for "safe" tasks (checking balances) but revert to physical branches for "sacred" or "complex" transactions (Zakat or financing). This prevents the bank from achieving its Cost Optimization Rate (COR) objectives.

### Statistical Analysis: Multiple Linear Regression

Prior to conducting the regression analysis, the data were evaluated through validity and reliability tests, as well as classical assumption tests to ensure that the model meets the required statistical criteria. The analysis has passed validity and reliability tests, as well as the required classical assumption tests, ensuring that the data meet the necessary statistical requirements. Specifically, all measurement items are declared valid, with factor loading

values exceeding 0.50. The reliability test results indicate that all variables have Cronbach's Alpha values above 0.70, demonstrating good internal consistency. Furthermore, the classical assumption tests show that the data are normally distributed, there is no multicollinearity (VIF values < 10), and no heteroscedasticity problem is detected.

The implementation of Multiple Linear Regression analysis using SPSS 21 was intended to quantify the magnitude of influence exerted by the independent variables on the adoption of BSI Mobile in Bireuen. The results, as summarized in Table 4.2, provide a rigorous statistical basis for validating the research hypotheses.

**Tabel 3. Standardized Regression Coefficients and Hypothesis Testing**

Variable	B	t-Statistic	Sig.(p)	VIF	Result
Digital Literacy (X <sub>1</sub> )	0.6	8.42	0.00	1.45	H1 Supported
Trust in Security (X <sub>2</sub> )	0.462	5.11	0.00	1.52	H2 Supported
Perceived Ease of Use (X <sub>3</sub> )	0.315	3.24	0.002	1.38	H3 Supported
Social Influence (X <sub>4</sub> )	0.28	2.98	0.004	1.25	H4 Supported

### Deep Econometric Interpretation

- Dominance of Digital Literacy (X<sub>1</sub>):**  
 With a standardized coefficient of 0.600 and a t-statistic of 8.420 ( $p < 0.001$ ), Digital Literacy emerges as the most powerful determinant in the model. Statistically, this implies that for every one-standard-deviation increase in digital literacy, the adoption of BSI Mobile increases by 60%, assuming other variables remain constant. This high t-value indicates that the impact of literacy is not only significant but also highly consistent across the respondent sample. In the Bireuen context, this suggests that the "Adoption Paradox" is primarily a capability gap rather than a lack of interest.
- The Critical Role of Trust (X<sub>2</sub>):**  
 Trust in Security yielded a coefficient of 0.462 ( $t = 5.110$ ;  $p < 0.001$ ). This reflects the high sensitivity of Acehnese customers toward the protection of their financial assets (Hifdz al-Maal). The significance of this variable confirms that in a mandatory banking environment, trust acts as the primary "risk-mitigation" mechanism. Without a guarantee of technical and ethical security, customers will remain "passive users" regardless of the legal mandate.
- Ease of Use (X<sub>3</sub>) and Social Influence (X<sub>4</sub>):**  
 While both variables are statistically significant ( $p < 0.01$ ), their lower  $\beta$  values (0.315 and 0.280) compared to literacy and trust suggest that they are secondary enablers. Perceived Ease of Use is necessary for the "user experience," but it is insufficient to drive adoption if the user lacks literacy. Social Influence, with the lowest  $\beta$  (0.280),

indicates that while communal validation (from family or Ulama) is important, the final decision to adopt digital banking remains an individual calculation of skill and safety.

### **Evaluation of Model Robustness and Multicollinearity**

The Variance Inflation Factor (VIF) for all variables ranges between 1.25 and 1.52, which is significantly below the threshold of 5.0 or 10.0. This statistically proves the absence of multicollinearity; meaning each independent variable provides unique information to the model without overlapping with others. This enhances the reliability of the  $\beta$  coefficients as independent predictors.

### **Analysis of Model Fit (R2) and Unexplained Variance**

The R2 value of 0.698 (Adjusted R2= 0.685) signifies a robust model fit. This means that 68.5% of the variance in BSI Mobile adoption in Bireuen can be explained by the four variables studied. However, the remaining 31.5% (Error Term) represents the "Unexplained Reality" of the semi-rural Aceh context.

This 31.5% variance is likely attributed to exogenous factors beyond the TAM framework, such as:

1. Infrastructure Reliability: Frequent power outages and intermittent 4G/5G signals in Bireuen's sub-districts, which physically hinder app access.
2. Cultural-Religious Sentiments: Specific local interpretations of digital interest (riba) or "fear of the unknown" in digital contracts (gharar) that may not be fully captured by standard "Trust" or "Social Influence" metrics.
3. Service Quality: The quality of interaction at the branch level that might either encourage or discourage a user from switching to the digital platform.

### **Thematic Discussion: Deconstructing the Determinants**

**The Literacy Bottleneck: Beyond Technical Skills (H1) Digital Literacy** ( $\beta = 0.600$ ) is the most dominant factor. In Bireuen, the barrier is not just "how to click," but "what happens if a mistake occurs." This Cognitive Anxiety creates a high mental transaction cost. According to Socio-Technical Systems (STS) theory, the digital transformation in Aceh has over-prioritized the Technical Subsystem (the BSI Mobile app) while neglecting the Social Subsystem (user capability). For many residents, the mobile app is perceived as an "Alien Interface" that lacks the human empathy and reassurance found in traditional bank tellers.

### **Trust as a Maqasid Shariah Framework (H2)**

Trust ( $\beta = 0.462$ ) in this study is deeply rooted in the concept of Hifdz al-Maal (Protection of Wealth). Following the systemic outages in Sharia banking in 2023, the Acehnese public who lack conventional banking alternatives felt a heightened sense of vulnerability. In Bireuen, a "system down" notification is not merely a technical error; it is perceived as a breach of Amanah (Integrity). Trust in security acts as the psychological bridge that allows a customer to transition their wealth from a physical branch to a digital smartphone.

### **Social Influence: The Ulama and Communal Validation (H4)**

Social Influence ( $\beta = 0.280$ ) confirms that Bireuen is a collectivist society. Technology is not accepted through individual logic but through Communal Legitimacy.

Recommendations from a Teungku (religious leader) serve as a "Moral Compass." If the Ulama frame digital banking as a tool for Sharia Economic Jihad or modern Muamalah efficiency, the perceived complexity of the app decreases, and social acceptance surges.

### **Comparative Analysis: Aceh Mandatory vs. National Voluntary Models**

The implementation of Islamic digital banking in Aceh, specifically in Bireuen Regency, offers a distinctive case study that deviates significantly from the standard Indonesian banking landscape. By comparing the local data with the national averages provided by the Financial Services Authority (OJK) and Bank Indonesia, we can identify a phenomenon termed the "Inclusion-Adoption Gap."

**Tabel 4. Comparative Digital Maturity Index: Aceh vs National Context**

Metrics	Aceh (Mandatory/Qonun LKS)	National Average (Voluntary/Market Driven)	Gap Analysis
Account Ownership	>95% (Artificial Inclusion)	~65% (Organic Growth)	+30%(Mandate Effect)
Active Digital Usage	~30% (Passive Adopters)	>55% (Active Adapters)	-25% (Literacy Gap)
Primary Driver	Legal Obligation (De Jure)	Convenience & Rewards (De Facto)	Coercive vs Incentivized
Customer Loyalty	Institutional Locking	High Switching Behavior	Monopoly vs Competition

### The Structural Success of De Jure Inclusion

Nationally, financial inclusion is a gradual process driven by market competition and financial literacy programs. However, in Bireuen, account ownership reached near-saturation levels almost overnight following the exit of conventional banks. This "Artificial Inclusion" indicates that the Qanun LKS has been highly successful in achieving Structural Migration. From a regulatory perspective, Aceh has outperformed other provinces in terms of formal access to Sharia-compliant financial institutions. However, this success is "De Jure" (by law) and does not necessarily reflect "De Facto" (by practice) financial engagement.

### The Behavioral Integration Failure and "Passive Resistance"

Despite the high inclusion rate, the active digital usage in Bireuen (~30%) is significantly lower than the national average (>55%). In urban centers like Jakarta or Surabaya, digital adoption is driven by Convenience (Ease of Use) and Price Value (Rewards/Cashback). In contrast, the Acehese user base exhibits what institutional theorists call "Passive Resistance." Because the banking relationship is mandated rather than chosen, customers feel a lack of Psychological Ownership over their digital accounts. In a voluntary market, a customer downloads a banking app because they want the benefits; in Bireuen, many customers have the app simply because the bank officer installed it during a mandatory account migration. This leads to a "Dormant Account" syndrome where the technology is present on the smartphone but remains unused in daily economic activities.

### Cost Optimization Paradox

The comparative data highlights a significant paradox for the bank's management. In the national voluntary model, digital banking effectively reduces operational costs because active users stop visiting physical branches. However, in the Aceh mandatory model, the bank faces a "Double Cost Burden." BSI must maintain expensive digital infrastructure to comply with modern banking standards while simultaneously maintaining high-capacity physical branches to serve the ~70% of the population who remain "analog" in their behavior.

This finding suggests that the "Grand Experiment" in Aceh cannot reach its full economic potential optimizing the Cost Optimization Rate (COR) until the strategy shifts from legal enforcement to Socio-Technical Empowerment. Without bridging the 25% gap in active digital usage compared to the national average, the digital transformation of Sharia finance in Aceh remains a structural success but a behavioral challenge.

### Managerial and Policy Implications: The Path to Cost Optimization

To achieve a successful Cost Optimization Rate (COR), the strategy must shift from "Mandating Compliance" to "Empowering Users."

1. Educational Transition: BSI should transform branches into "Education Hubs" rather than "Transaction Centers," specifically targeting older demographics for assisted digitalization.
2. Ulama-Digital Partnership: Creating digital literacy modules for Dayahs (Islamic schools) ensures that the next generation of community leaders acts as "Digital Ambassadors."
3. Policy Alignment: The regional government must provide "Digital Literacy Roadmaps" to support the Qanun LKS, ensuring the transition is socially inclusive and economically efficient.

The "Grand Experiment" of Sharia financial transformation in Aceh, mandated by Qanun LKS No. 11 of 2018, has successfully achieved structural and administrative migration, yet it faces a significant substantive adoption gap. This study concludes that a top-down legal mandate is a powerful tool for institutional change but an insufficient driver for behavioral technology adoption. Empirical evidence from 200 respondents in Bireuen Regency reveals a striking "Adoption Paradox": while 100% of customers are legally integrated into the Sharia banking system, only 30% are classified as active digital users, with the majority utilizing the application merely for basic utilities such as balance inquiries.

Statistical analysis using multiple linear regression confirms that adoption is driven by a complex interplay of socio-technical factors. Digital Literacy (X1) emerged as the most dominant predictor ( $\beta = 0.600$ ;  $p < 0.001$ ), indicating that the primary barrier to digital transformation is cognitive rather than structural. This is followed by Trust in Application Security (X2) ( $\beta = 0.462$ ;  $p < 0.001$ ), which serves as a psychological anchor rooted in the Maqasid Shariah principle of Hifdz al-Maal (Protection of Wealth). While Perceived Ease of Use (X3) ( $\beta = 0.315$ ) and Social Influence (X4) ( $\beta = 0.280$ ) are statistically significant, they function as secondary enablers that rely on the foundational pillars of literacy and trust.

Ultimately, this research implies that to achieve an optimal Cost Optimization Rate (COR) and true financial inclusion, Islamic financial institutions and the Aceh government must shift from a "Legal-Centric" approach to a "Human-Centric" empowerment strategy. Legal enforcement can open the door to Sharia banking, but only robust cybersecurity and targeted digital literacy programs can encourage the community to step through that door into a fully digital financial ecosystem. Bridging this 70% adoption gap is essential to ensure that Aceh's Sharia mandate results in a banking system that is not only religiously compliant but also technologically efficient and economically competitive.

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