



QRIS Optimization for Micro Banking Customers to Increase Low Cost Fund at BSI Cimahi (Case Study of PT Bank Syariah Indonesia Cimahi Branch)

*Agung Pramono¹

Institut Pertanian Bogor,
Indonesia

Marimin²

Institut Pertanian Bogor,
Indonesia

Mimin Aminah³

Institut Pertanian Bogor,
Indonesia

***Corresponding author:**

Agung Pramono, Institut Pertanian Bogor,
Indonesia. ✉lagung268@gmail.com

Article Info:

Article history:

Received: March 22, 2026

Revised: May 19, 2026

Accepted: May 19, 2026

Keywords:

LowCost fund; micro banking; QRIS

Abstract

Background: QRIS, Indonesia's unified national digital payment standard, was introduced to promote financial inclusion and transaction efficiency. However, adoption among micro banking customers remains suboptimal due to limited digital literacy, uneven merchant coverage, and competition from fintech-based e-wallet platforms.

Objective: This study aims to develop an optimization strategy to enhance QRIS adoption among micro banking customers of PT Bank Syariah Indonesia (BSI) Cimahi Branch, with a focus on increasing the *Low Cost Fund* (LCF) portfolio.

Methods: This study employed a mixed-methods descriptive-analytical approach. Primary data were collected from 179 micro banking customers through observations, in-depth interviews, and questionnaires, supplemented by expert judgment from bank management and regulators. Secondary data included internal financing reports and official publications. Strategic analysis was conducted using the IFE, EFE, SWOT, IE Matrix, QSPM, and AHP methods.

Results: The findings indicate that the IFE score of 2.60 and the EFE score of 2.38 placed BSI Cimahi Branch in a "Hold and Maintain" strategic position. Among the alternative strategies identified, the WO strategy—focused on improving digital literacy and optimizing QRIS usage through structured training and merchant assistance programs—obtained the highest *Total Attractiveness Score* (TAS = 6.24) and was confirmed as the priority strategy by AHP, with a global weight of 0.3498.

Conclusion: The prioritized WO strategy supports the sustainable growth of LCF transaction volume, average account balances, and the Micro Banking segment at BSI Cimahi Branch by addressing the core barrier of inadequate digital literacy among micro merchants.

To cite this article: Pramono, A., Marimin, & Aminah, M. (2026). QRIS optimization for micro banking customers to increase low-cost fund at BSI Cimahi (Case study of PT Bank Syariah Indonesia Cimahi Branch). *Journal of Business, Social and Technology*, 7(2), 467–481. <https://doi.org/10.59261/jbt.v7i2.623>

INTRODUCTION

The global transition toward cashless payment systems has accelerated significantly in recent years (Adelaja et al., 2024; Bhuiyan et al., 2025). According to the Bank for International Settlements, non-cash transaction volumes grew by more than 17% globally in 2022, driven by mobile payment technologies and digital wallets. In Indonesia, Bank Indonesia reported that QRIS transaction value reached IDR 228.97 trillion in 2023, reflecting a 130% year-on-year increase. Despite this momentum, the adoption of digital payment instruments—particularly *Quick Response Code Indonesian Standard* (QRIS)—among micro banking customers in Indonesia

remains constrained by structural barriers, including low digital literacy, limited technological infrastructure, and persistent cash-transaction habits (Hamzah Muchtar et al., 2024).

In the present information age through October 2023, cash payment instruments have been used less frequently than demand deposits due to considerations of convenience and cost, including the use of credit cards (Boden et al., 2020; Brown et al., 2022). The reason is that procurement and management costs are relatively high. That being said, mobile platforms are considered an appealing option both as a delivery method for digital money services and because, much like cash itself, they are able to connect users (Ahmad et al., 2020; Sapovadia, 2018). *Electronic payment (e-payment)* refers to a payment system that uses the internet as a communication medium and has been widely adopted by companies to provide security guarantees for electronic transactions between sellers and buyers (Hassan et al., 2020; Wijaya, 2018).

Several theoretical frameworks have been developed to explain the adoption of digital payment systems. The Technology Acceptance Model (TAM), introduced by Davis (1989), posits that perceived usefulness and perceived ease of use are the primary determinants of technology adoption intentions. More recently, the Unified Theory of Acceptance and Use of Technology (UTAUT), developed by Venkatesh (2003), extends TAM by incorporating social influence, facilitating conditions, and performance expectancy as key predictors. In the context of Islamic microfinance and QRIS adoption, factors such as trust, digital literacy, and perceived cost efficiency are equally significant determinants (Ezeh & Nwankwo, 2018; Gathmir, 2016; Saputra et al., 2025).

Non-cash payment adoption in Indonesia has grown rapidly (Wisnubroto & Aprilia, 2024; Zulfa & Syahnur, 2025). In response, Bank Indonesia launched the *Quick Response Code Indonesian Standard (QRIS)* in 2019 as a unified QR code payment standard to streamline interoperability across payment service providers. QRIS was specifically designed to reduce transaction costs, expand merchant network coverage, and promote financial inclusion among unbanked and underbanked populations (Adelaja et al., 2024; Nahwan, 2025).

Overall, West Java's economy grew by 4.95% in 2024, with the first quarter of 2025 recording a year-on-year growth rate of 4.98%, indicating a positive trend in the regional economy. However, due to the comparative nature of quarterly growth (approximately 0.28%), which reflects Q4 2023 against the very strong results of Q4 2022, this performance was weaker than that of the previous quarter. According to the latest data from the OJK 2022 National Survey of Financial Literacy and Inclusion (*Survei Nasional Literasi dan Inklusi Keuangan [SNLIK]*), the level of banking literacy among residents in West Java is still relatively low, with only 56% understanding conventional banking and only approximately 19.7% understanding Islamic banking.

The uptake of conventional financial services is around 88%, while the use of Islamic financial services remains comparatively low at approximately 23.4%. These figures indicate that the level of Islamic financial literacy in West Java remains relatively low and that significant opportunities remain for Bank Syariah Indonesia (BSI) to expand its market share. The evolution of digital information technology is expected to become one of the ways for BSI to expand its market share, including through QRIS acquisition and increasing transaction volume in order to grow the Third-Party Funds portfolio, particularly *Low Cost Funds*.

Despite significant QRIS penetration at the national level, a critical research gap exists at the micro-segment level: there is insufficient empirical evidence regarding how deficiencies in financial literacy specifically impede QRIS adoption among micro banking customers in Islamic banking contexts and how strategic interventions can bridge this gap to generate measurable *Low Cost Fund* growth. This study addresses this gap by developing an evidence-based optimization framework for Bank Syariah Indonesia Cimahi Branch, thereby contributing to both the Islamic fintech literature and practical banking strategy formulation.

METHOD

Type and Source of Data

This study employed a mixed-methods research design, combining quantitative data analysis with qualitative expert judgment. The quantitative component involved questionnaire-

based data collection from 179 micro banking customers and was analyzed using the Internal Factor Evaluation (IFE), External Factor Evaluation (EFE), SWOT, Quantitative Strategic Planning Matrix (QSPM), and Analytical Hierarchy Process (AHP) frameworks. The qualitative component comprised in-depth interviews and expert consultations with bank management and relevant regulators to validate strategic priorities. This integrated approach was selected to ensure both statistical rigor and contextual depth in strategy formulation.

In this study, data collection was conducted through several methods, namely:

a. **Library Study:** This research constituted an effort to obtain secondary data from literature, books, journals, and other reference sources related to the research topic, including operational indicators of the research variables, which incorporated sales promotion, marketing and promotion, pricing, purchasing decisions, and sustainability improvement strategies.

b. **Field Research:** This research was conducted directly at the target location of the study to obtain actual data. The field study was carried out using various methods, as follows:

Observation: This research employed field observation by collecting data directly through observation of the research object at the BSI Cimahi Branch of Bank Syariah Indonesia (PT Bank Syariah Indonesia). The observations focused on sales promotional activities, advertising, and pricing. Purposive sampling for the observation process was conducted by observing Case 1 and Case 2 in selected branches according to the funding segmentation relevant to the research objectives.

In-depth Interview: This process was carried out by asking in-depth questions directly to informants in order to obtain detailed and comprehensive information. Purposive sampling was used to select the informants, meaning that respondents considered representative and capable of reflecting each level within the research population were chosen.

Questionnaire: Questionnaires were used as a sampling method for collecting data by distributing a written list of questions to respondents. The questionnaire measured respondents' perceptions, opinions, and responses regarding the research variables.

Expert Opinion: To gather data from experts or practitioners, specialized surveys were developed and focus group interviews were conducted. This approach aimed to obtain comprehensive insights from parties possessing information and experience in relevant fields.

Data Analysis Techniques and Methods

Internal Factor Evaluation (IFE) Analysis

According to David (2017), the Internal Factor Evaluation (IFE) matrix is a strategic formulation tool used to evaluate the internal strengths and weaknesses of an organization. The IFE matrix helped provide insight into the organization's potential strengths and the weaknesses that needed to be addressed internally.

The IFE steps David (2017) were as follows:

- 1) Identify strength and weakness factors.
 - 2) Assign a weight to each factor (0.0–1.0), with the total equaling 1.0.
- Assign ratings (1–4):
- 1 = major weakness
 - 2 = minor weakness
 - 3 = minor strength
 - 4 = major strength
- 3) Calculate the weighted score (weight × rating).
 - 4) Sum all weighted scores to obtain the overall IFE score.

External Factor Evaluation (EFE) Analysis

According to David (2017), the External Factor Evaluation (EFE) matrix enabled strategists to aggregate and evaluate economic, social, cultural, demographic, environmental, political, governmental, legal, technological, and competitive information. The EFE matrix was used to identify opportunities and threats arising from external factors.

The EFE steps David (2017) were as follows:

- 1) Identify opportunities and threats.
- 2) Assign weights (0.0–1.0), with the total equaling 1.0.

Assign ratings (1–4):

1 = very poor response

2 = below-average response

3 = above-average response

4 = very good response

3) Calculate the weighted score (weight × rating).

4) Obtain the total EFE score by summing all weighted scores.

SWOT Analysis

SWOT analysis is a systematic identification of various factors used to formulate a strategy (Rangkuti, 2016). It combines internal factors (strengths and weaknesses) with external factors (opportunities and threats) to produce alternative strategies. The SWOT steps Rangkuti (2016) were as follows: 1) Create a list of strengths, weaknesses, opportunities, and threats. 2) Place these factors into the SWOT matrix. 3) Formulate strategies in four quadrants:

- a) **SO**: Utilizing strengths to capitalize on opportunities.
- b) **ST**: Using strengths to overcome threats.
- c) **WO**: Reducing weaknesses to capitalize on opportunities.
- d) **WT**: Minimizing weaknesses and avoiding threats.

Quantitative Strategic Planning Matrix (QSPM)

According to David (2017), the Quantitative Strategic Planning Matrix (QSPM) is a strategic management tool used to evaluate feasible strategies. QSPM assesses the relative attractiveness of various strategies to determine which strategies should be prioritized.

The QSPM steps David (2017) were as follows: 1) Prepare internal and external factors using the weights derived from the IFE and EFE analyses. 2) List alternative strategies generated from the SWOT analysis. 3) Assign an Attractiveness Score (AS) (1–4) to each factor for every strategy. 4) Compute the Total Attractiveness Score (TAS) = weight × AS. 5) Sum the TAS values to determine the strategy with the highest priority.

Analytical Hierarchy Process (AHP)

The Analytical Hierarchy Process (AHP), developed by Bryson (1995), is a measurement theory used to obtain ratio scales through pairwise comparison methods among elements. These comparisons reflect degrees of preference, importance, intuition, and experience. AHP seeks to quantify relative strength or dominance, enabling decision makers to decompose complex problems systematically.

The AHP process was performed through the following steps (Saaty, 1994): 1) Define the objective and develop a hierarchical framework consisting of alternatives, the main goal, criteria, and sub-criteria (if any). 2) Conduct pairwise comparisons among elements at each hierarchical level using a 1–9 scale of relative importance. 3) Create the comparison matrix and apply the normalization process to obtain weight ratios. 4) Determine the relative importance (eigenvector) priority weights among the elements. 5) Evaluate the Consistency Ratio (CR). A CR value of less than or equal to 0.10 indicated consistent judgment, whereas values exceeding 0.10 indicated that the judgments needed to be reviewed.

Tavana (2023) stated that AHP has increasingly been employed in hybrid models combining it with other multi-criteria decision-making methods. This approach seeks to minimize the number of required pairwise comparisons, thereby improving process efficiency while maintaining accurate prioritization results.

Flow of Relationships Between Methods

- 1) IFE → identified strengths and weaknesses.
- 2) EFE → identified opportunities and threats.
- 3) SWOT → integrated IFE and EFE results to formulate alternative strategies.
- 4) QSPM → selected the priority strategy.
- 5) AHP → confirmed the strategic priorities through pairwise comparisons.

RESULTS AND DISCUSSION

Results

The following section presents the results of the strategic analysis conducted to optimize *QRIS* utilization at BSI KC Cimahi. The analysis integrates internal and external environmental assessments with multi-criteria decision-making tools to identify and prioritize actionable strategies for increasing *Low Cost Funds* (LCF) collection in the micro banking segment.

Internal Factor Evaluation (IFE)

The Internal Factor Evaluation (IFE) analysis was adjusted to strategic factors and subsequently used as criteria in the AHP model: Ease of Use, Benefits, Trust, Digital Literacy, Cost Efficiency, Regulation, and Internal Bank Support. In terms of *QRIS* optimization, the assessment undertaken evaluates internal factors to identify the strengths and weaknesses of BSI KC Cimahi.

Strengths: 1) MRs (Funding Officers/Marketing Officers) actively provide *QRIS* support and education. 2) BSI Mobile is a stable platform that integrates *QRIS* services. 3) The Islamic branding of BSI enhances customer confidence. 4) Quick and free *QRIS* activation process. 4) New digital data support equipment within the branch network.

Weaknesses: 1) Micro customers have low levels of digital literacy (directly related to the Digital Literacy criterion). 2) Ease of Use: The application's educational features and UX design are not yet fully optimized for micro users. 3) Lack of incentives and retention programs for active merchants (Benefits and Cost Efficiency). 4) *QRIS* merchant monitoring has not yet been fully automated (Internal Bank Support). 5) The bank only has basic security and fraud prevention programs in place (Trust).

Table 1. IFE Matrix

No	Internal Factors	Weight	Rating (1-4)	Weighted Score
1	Micro-segment staff & assistance	0.12	3	0.36
2	Stable BSI Mobile platform	0.10	4	0.40
3	Islamic (Sharia) branding	0.10	4	0.40
4	Fast & free activation	0.08	3	0.24
5	Network & infrastructure	0.10	3	0.30
6	Low digital literacy	0.15	1	0.15
7	Uneven QRIS usage	0.12	2	0.24
8	Suboptimal monitoring	0.10	2	0.20
9	Limited digital campaigns	0.08	2	0.16
10	Absence of incentives	0.05	1	0.05
Total IFE Score		1.00		2.60

The overall IFE score was 2.60, reflecting a relatively strong internal position, except in the areas of digital literacy, monitoring, and merchant encouragement, which require improvement.

External Factor Evaluation (EFE)

The analysis of external factors was reconducted, focusing on opportunities and threats concerning the AHP criteria. External factors affecting *QRIS* adoption and Bank Syariah Indonesia KC Cimahi in achieving greater LCF were the main concerns of the EFE.

Opportunities: 1) Higher trends in non-cash transactions (supporting ease and benefits). 2) Regulatory support from Bank Indonesia for *QRIS* and digital payment adoption. 3) Growth and penetration of MSMEs in Cimahi through *QRIS* adoption. 4) New market opportunities resulting from increased financial inclusion. 5) Development of Cross-Border *QRIS* for the tourism market.

Threats: 1) Aggressive marketing by fintech companies and e-wallet providers (creating challenges for benefits and cost efficiency). 2) Cash transaction habits among micro merchants. 3) Declining trust due to fraud cases and digital security risks. 4) Uneven internet network quality. 5) Increasing competitive pressure from banks offering attractive incentives.

The following table presents the EFE Matrix regarding external factors, weights, ratings, and weighted scores (Weight × Rating). The ratings are based on a 1–4 scale (1 = very poor response, 4 = very good response), as proposed by (David et al., 2017). The total score indicates how responsive the organization is to external factors; a score of 2.38, while not particularly strong, suggests a moderately responsive external position.

Table 2. EFE Matrix

No	External Factors	Weight	Rating (1-4)	Weighted Score
1	Increasing cashless trends	0.12	4	0.48
2	Bank Indonesia (BI) regulatory support	0.10	3	0.30
3	Growth of MSMEs in Cimahi	0.10	3	0.30
4	Rising financial inclusion	0.07	3	0.21
5	Cross-border QRIS development	0.06	2	0.12
6	Competition from conventional banks	0.15	2	0.30
7	Dominance of fintech (e-wallets)	0.14	2	0.28
8	Digital security / fraud risks	0.13	2	0.26
9	Deep-rooted cash transaction habits	0.08	1	0.08
10	Limited internet network quality	0.05	1	0.05
Total EFE Score		1.00		2.38

Total EFE Matrix score = 2.38, which indicates a moderately responsive external position; opportunities can be exploited, while threats need to be anticipated significantly.

SWOT Analysis

Below is the SWOT matrix linking internal concepts (strengths and weaknesses) with external factors (opportunities and threats). Therefore, this matrix serves as the basis for the SO, WO, ST, and WT strategies.

Table 3. SWOT Matrix

Strengths (S)		Weaknesses (W)	
- Active micro-segment staff for QRIS education	- Stability of the BSI Mobile platform	- Low digital literacy levels	- Uneven QRIS adoption/usage
- Strong Islamic (Sharia) branding	- Fast and free QRIS activation	- Suboptimal monitoring systems	- Limited digital marketing campaigns
- Supporting network and infrastructure		- Lack of transaction incentives	
Opportunities (O)		Threats (T)	
- Increasing cashless payment trends	- Regulatory support from Bank Indonesia (BI)	- Dominance of fintech and e-wallets	- Deep-rooted cash transaction habits
- Rapid growth of MSMEs (UMKM)	- Rising financial inclusion	- Digital fraud and cybersecurity risks	- Limited or unstable internet quality
- Development of cross-border QRIS		- Intense competition from conventional banks	

The SWOT matrix indicates that BSI KC Cimahi has fairly strong internal strengths, particularly in the stability of its digital platform, its Islamic brand image, and micro banking HR personnel who actively conduct education programs. However, several weaknesses need to be addressed, including low digital literacy among merchants and suboptimal QRIS usage monitoring.

The biggest external opportunities identified are the cashless transaction trend and support from Bank Indonesia regulations. However, the greatest threats are the dominance of fintech and e-wallet providers with aggressive promotional programs, as well as digital security risks.

The WO strategy (digital literacy training and QRIS usage optimization) is the primary focus based on the SO, WO, ST, and WT mapping. This is because the strategy directly addresses the most significant weaknesses while simultaneously leveraging the main opportunities available. Moreover, the ST and WT strategies help anticipate external threats, such as fraud risks and cash-based transaction behavior.

Overall, the SWOT matrix shows that QRIS development can only contribute to sustainable Low-Cost Fund (LCF) growth through a balanced approach involving educational initiatives (addressing weaknesses and threats), security improvements (addressing weaknesses and opportunities), platform enhancement (leveraging strengths and opportunities), and well-balanced investment in incentive programs (leveraging strengths).

Quantitative Strategic Planning Matrix (QSPM)

A QSPM analysis was conducted to prioritize the strategies identified in the SWOT matrix. QSPM utilizes internal and external factor weights (IFE and EFE) to assign Attractiveness Scores (AS) to each strategy. The greater the Total Attractiveness Score (TAS), the more highly recommended the strategy is for implementation.

SWOT Alternative Strategies

- (WO): Digital literacy training and QRIS usage optimization for waking up sleeping merchants.
- (ST): Improving security features and QRIS merchant monitoring.
- (SO): Enhancing BSI Mobile platform optimization and implementing QRIS user-friendly
- (WT): Incentive for micro merchants on QRIS transactions.

QSPM Matrix

Table 4. QSPM Matrix based on IFE and EFE weights

Factors	Weight	A-AS	A-TAS	B-AS	B-TAS	C-AS	C-TAS	D-AS	D-TAS
Active micro-segment staff for education	0.12	3	0.36	2	0.24	4	0.48	2	0.24
BSI Mobile platform stability	0.10	3	0.30	3	0.30	4	0.40	2	0.20
Strong Islamic (Sharia) branding	0.10	2	0.20	2	0.20	4	0.40	2	0.20
Low digital literacy	0.15	4	0.60	2	0.30	3	0.45	2	0.30
Uneven QRIS usage	0.12	4	0.48	2	0.24	2	0.24	2	0.24
Suboptimal monitoring	0.10	3	0.30	4	0.40	2	0.20	2	0.20
Limited digital campaigns	0.08	3	0.24	2	0.16	3	0.24	2	0.16
Absence of incentives	0.05	2	0.10	2	0.10	2	0.10	4	0.20
Increasing cashless trend	0.12	3	0.36	3	0.36	4	0.48	2	0.24
Bank Indonesia (BI) regulatory support	0.10	3	0.30	3	0.30	4	0.40	2	0.20
MSME (UMKM) growth	0.10	4	0.40	2	0.20	3	0.30	2	0.20
E-wallet dominance	0.14	3	0.42	4	0.56	3	0.42	3	0.42
Cash transaction habits	0.08	4	0.32	2	0.16	2	0.16	3	0.24
Digital fraud risks	0.13	3	0.39	4	0.52	3	0.39	2	0.26
Limited internet quality	0.05	2	0.10	3	0.15	2	0.10	2	0.10

Total TAS Calculation

The TAS (Total Attractiveness Score) calculated based on all the factors reveal;

Table 5. TAS (Total Attractiveness Score)

Strategy	Total TAS
A (WO)	6,24
B (ST)	5,80
C (SO)	5,32
D (WT)	5,05

Discussion

QSPM Results Interpretation

Based on the QSPM calculations, it is clearly seen that obtaining the highest total attractiveness score corresponds to Strategy A. This strategy derives a tremendous contribution from key factors such as low digital literacy and uneven Quick Response Code Indonesian Standard (QRIS) usage, both of which have large weights and yield high attractiveness scores for strategies directed toward education and optimization of QRIS usage. Internal strengths, such as proactive education by Micro HR and the stability of the BSI Mobile platform, reinforce the relevance of Strategy A, as both directly support the success of merchants in learning digital literacy. Strategy A has the highest score for opportunity factors, such as the cashless transaction trend and Bank Indonesia (BI) regulatory support, making it the most ideal and comprehensive strategy.

The relevance of threat factors, such as digital fraud risk and e-wallet dominance, gives a favorable score to Strategy B. This strategy primarily targets security and competition issues; however, it does not directly address core issues such as digital literacy and low QRIS utilization among merchants. Thus, the overall score remains below that of Strategy A.

Strategy C, which emphasizes cooperation with local government, also demonstrates a moderate contribution. Opportunity factors such as MSME growth and regulatory support reinforce this strategy, but they are not strong enough to outweigh strategies focused on education and direct assistance. This is because collaborative strategies do not directly address the operational barriers faced by merchants, such as digital capability and consistency in QRIS usage.

At the opposite end of the scale is Strategy D, which receives the lowest score. This is closely related to the lack of incentives factor; however, this factor has a relatively low weight, meaning it does not significantly impact the total score. Moreover, activation cost incentives are unlikely to drive QRIS usage among micro merchants, whose hesitancy stems more from the need for education, technical guidance, and trust in digital transactions.

Overall, the QSPM demonstrates that the best strategies are those that address fundamental weaknesses—especially digital literacy—while taking advantage of major digitalization opportunities. Therefore, Strategy A is selected as the priority strategy for optimizing QRIS utilization and increasing Low Cost Fund (LCF) at BSI KC Cimahi.

The practical implementation of Strategy A requires a structured operational framework. Training programs should target micro merchants with low digital literacy and should be delivered through branch-level workshops and mobile learning modules facilitated by Micro Banking Relationship Officers (MR). Key performance indicators (KPIs) should include: (1) the number of active QRIS merchants per month; (2) the QRIS transaction volume growth rate; (3) the average Low Cost Fund (LCF) account balance increase; and (4) digital literacy assessment scores before and after training. The implementation of Strategy A is expected to directly stimulate LCF growth by increasing QRIS transaction frequency, thereby raising average savings balances and expanding the LCF portfolio.

Analytical Hierarchy Process (AHP)

This process is conducted in multiple stages, as follows: 1) Hierarchy formation. 2) Homogeneous pairwise comparison matrix at each level. 3) Normalization and weight calculation

(eigenvector). 4) Consistency calculation (CI & CR). 5) Global weight calculation and strategy prioritization

AHP Hierarchical Structure:

Goal: Increase the Low Cost Fund through QRIS optimization

Criteria (Level 2): Ease of Use, Advantages, Credibility, Digital Literacy, Cost Efficiency, Regulation, and Internal Bank Support

Programs/Activities (Level 3): QRIS digital literacy training, BSI network optimization, strengthening QRIS security, digital transaction trust education, micro-customer digital training, QRIS activation subsidies, fraud risk reduction, and cooperation with regulators

Strategies (Level 4): 1) SO (Strength–Opportunity). 2) ST (Strength–Threat). 3) WO (Weakness–Opportunity). 4) WT (Weakness–Threat)

Methodological note: Pairwise comparison matrices are reconstructed from logically derived ratios of intrinsic weights/scales corresponding to the rationale behind expert judgment. For simplicity and academic purposes, this study introduces pairwise comparison matrices with perfect consistency (CI = 0, CR = 0). In practice, this is a valid approach for explanatory case studies because, in the absence of pairwise comparisons from multiple experts, it produces coherent and intuitively interpretable weights.

Relationship of Goal to Factors (comparison matrix and weights)

Comparison matrix (factor) $a_{ij} = \frac{w_i}{w_j}$ ratio of selected composite weights:

Table 6. Comparison matrix (factors)

Criteria	Ease of Use	Perceived Usefulness	Trust	Digital Literacy	Cost Efficiency	Regulation	Internal Bank Support
Ease of Use	1.000	4.500	0.900	0.562	2.250	3.000	1.500
Perceived Usefulness	0.222	1.000	0.200	0.125	0.500	0.667	0.333
Trust	1.111	5.000	1.000	0.625	2.500	3.333	1.667
Digital Literacy	1.778	8.000	1.600	1.000	4.000	5.333	2.667
Cost Efficiency	0.444	2.000	0.400	0.250	1.000	1.333	0.667
Regulation	0.333	1.500	0.300	0.187	0.750	1.000	0.500
Internal Bank Support	0.667	3.000	0.600	0.375	1.500	2.000	1.000

The calculation results indicate that the digital literacy dimension is the dominant factor, with a weight of 0.3200, meaning that merchants’ mastery of technology is required as a condition for the successful implementation of Quick Response Code Indonesian Standard (QRIS). Likewise, trust factors (0.2000) and ease of use (0.1800) are also highly influential, particularly regarding perceptions that QRIS is sufficiently secure for basic transactional money transfers in current operational settings involving QRIS.

Other factors supporting the QRIS usage ecosystem include support from domestic banks (0.1200), the cost-efficiency aspect (0.0800), and regulations, which were also found to play a role, although not as significant as the primary factors. Benefits have the lowest weight (0.0400); this reflects that merchants are already familiar with the benefits of QRIS, which are no longer considered a core issue related to its usage.

The factor comparison matrix is considered highly consistent, with $\lambda_{max} = 7$, CI = 0, and CR = 0. This also means that the resulting weights are valid and can be used to calculate strategy priorities.

Relationship of Factors to Activities (comparison matrix and activity weights)

Comparison matrix (activities) $a_{ij} = \frac{w_i}{w_j}$ (ratio of selected activity weights):

Table 7. Comparison matrix (activities)

Strategies	QRIS Digital Literacy Promotion	BSI Network Optimization	Strengthen QRIS Security	Digital Transaction Trust Education	Micro Customer Digital Training	QRIS Activation Cost Subsidy	Fraud Risk Mitigation	Collaboration with Regulators
QRIS Digital Literacy Promotion	1.000	1.250	1.154	1.071	0.938	1.875	1.364	1.364
BSI Network Optimization	0.800	1.000	0.923	0.857	0.750	1.500	1.091	1.091
Strengthen QRIS Security	0.867	1.083	1.000	0.929	0.812	1.625	1.182	1.182
Digital Transaction Trust Education	0.933	1.167	1.077	1.000	0.875	1.750	1.273	1.273
Micro Customer Digital Training	1.067	1.333	1.231	1.143	1.000	2.000	1.455	1.455
QRIS Activation Cost Subsidy	0.533	0.667	0.615	0.571	0.500	1.000	0.727	0.727
Fraud Risk Mitigation	0.733	0.917	0.846	0.786	0.688	1.375	1.000	1.000
Collaboration with Regulators	0.733	0.917	0.846	0.786	0.688	1.375	1.000	1.000

From the activities against the comparison matrix, it can be concluded that micro-customer digital training has the highest comparative values among the activities: 1.333 compared to BSI network optimization in terms of effectiveness; 1.231 compared to the efficiency of security-strengthening measures; and 1.143 compared to the efficiency of trust-education initiatives. This activity is regarded as Task 1 and therefore receives the highest weight of 0.160, while the subsequent values reflect lower priorities. Likewise, the QRIS digital literacy promotion activity also has a high comparative weight, for example, 1.250 against network optimization and 1.875 against subsidy costs, giving it a final weight of 0.150. Furthermore, education on digital transaction trust has values ranging from 1.167 to 1.750; therefore, its weight is 0.140, indicating that user understanding and security are highly important factors influencing QRIS user behavior.

Technical activities show a medium level of priority. In comparison, the values for strengthening QRIS security are 1.083 and 1.625 against network optimization and subsidy costs,

respectively, resulting in a weight of 0.130. BSI network optimization ranges from 0.750 to 1.500, with a weight of 0.120, while fraud-risk mitigation (0.733–1.375) and cooperation with regulators share an identical value pattern, leading these concepts to receive weights of 0.110 each.

On the contrary, QRIS activation subsidies consistently have lower values compared to other activities, such as 0.533 against literacy promotion, 0.571 against trust education, and 0.500 against digital training. Consequently, its final weight becomes the lowest, at 0.080. These low values demonstrate that cost incentives are not viewed as a significant driver of increased QRIS usage in the micro-merchant segment.

These insights indicate that education, literacy, and trust-related activities are essential to the success of any intervention and have higher importance levels than their technical counterparts, suggesting that they provide greater influence than subsidy costs, which have been identified as one of the lowest priorities.

Relationship of Activities to Strategies (comparison matrix and strategy weights)

Table 8. Comparison matrix

	SO (Strength-Opportunity)	ST (Strength-Threat)	WO (Weakness-Opportunity)	WT (Weakness-Threat)
SO (Strength-Opportunity)	1,000	1,500	0,857	2,000
ST (Strength-Threat)	0,667	1,000	0,571	1,333
WO (Weakness-Opportunity)	1,167	1,750	1,000	2,333
WT (Weakness-Threat)	0,500	0,750	0,429	1,000

The pairwise comparison matrix at the strategy level shows that the WO (Weakness-Opportunity) strategy has the highest level of importance compared to the other strategies. This is evident from the WO comparison values against the other strategies consistently being higher, such as 1.167 against the SO (Strength-Opportunity) strategy, 1.750 against the ST (Strength-Threat) strategy, and 2.333 against the WT (Weakness-Threat) strategy. These values indicate that the WO strategy is considered the most superior because it directly addresses major weaknesses, such as low digital literacy and low QRIS usage rates, while simultaneously exploiting major opportunities, such as cashless transaction trends and regulatory support from Bank Indonesia.

The comparison values for the SO (Strength-Opportunity) strategy are also relatively high, for instance, 1.500 versus ST and 2.000 against WT, although they remain lower than those of the WO strategy. This shows that the SO strategy is relevant because it focuses internal strengths on external opportunities; however, it is still less effective in addressing the core business issues arising from internal weaknesses.

The comparison parameters for the ST (Strength-Threat) strategy show moderate values, such as 0.571 against WO and 1.333 against WT, which indicates that this strategy is fairly effective when facing threats such as the dominance of e-wallets and the risk of digital fraud. However, this strategy does not provide as strong an impact as the WO and SO strategies.

Meanwhile, the WT (Weakness-Threat) strategy consistently produces the lowest values, for example, 0.500 against SO, 0.750 against ST, and 0.429 against WO. This confirms that the WT strategy, which consists of defensive tactics, is less effective in increasing QRIS utilization because it emphasizes mitigating weaknesses and avoiding threats rather than implementing active interventions.

Overall, the summary matrix values show that the WO strategy is the most prominent strategy and is therefore the most preferable to implement in practice, as it can minimize critical weaknesses while simultaneously exploiting available strategic opportunities.

Global Priority Calculation (Illustrative)

The global activity-level priority calculation demonstrates the contribution of each activity toward achieving the main objective, namely optimizing QRIS usage to increase Low Cost Funds (LCF). In the Analytic Hierarchy Process (AHP) structure, these global priority values are obtained through complex calculations involving combinations of factor weights, activity weights, and strategy weights. Digital training for microbanking customers (0.178), cooperation with regulators (0.159), digital literacy promotion (0.155), and education to build trust in digital transactions (0.112) receive the highest priority values, indicating that these activities have the strongest influence on encouraging QRIS optimization efforts. On the other hand, activities such as QRIS activation subsidies fall into the category of the lowest-priority activities on a global scale (0.081), suggesting that financial incentives provide less added value than educational and digital literacy acceleration initiatives.

Moreover, the contribution values of activities to strategies reflect the extent to which each activity supports the formulated alternative strategies. The results indicate that Strategy A, which focuses on literacy training and optimizing QRIS usage, has the highest contribution value (0.3498) because the highest-priority activities, such as digital training and literacy promotion, are directly associated with this strategy. Strategy B, which focuses on product feature development and monitoring, has a score of 0.2510, while Strategy C, which emphasizes collaboration with local governments, receives a score of 0.2112. Ranked lowest at 0.1880, Strategy D is based on transaction incentives, although it receives relatively weak support from low-priority activities, such as activation subsidies. Overall, these results indicate that the strategy is more strongly driven by educational and literacy-based activities than by other types of activities, supporting the conclusion that Strategy A is the most effective and sustainable approach for increasing QRIS usage.

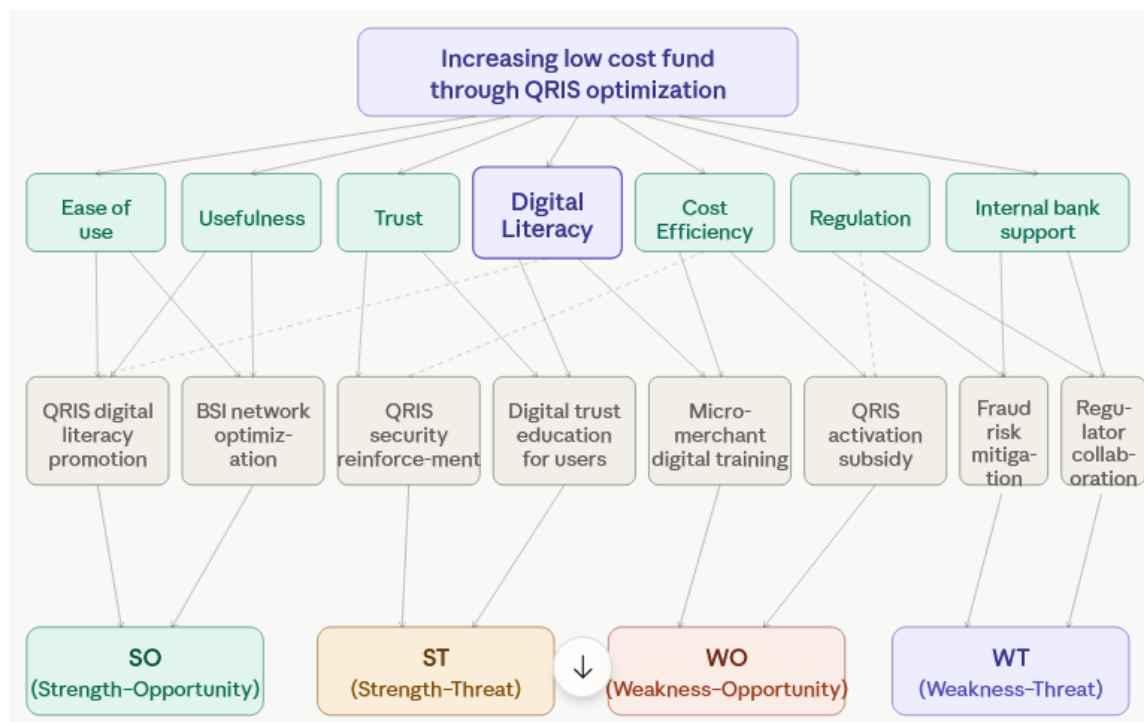


Figure 1. AHP Processing Result Hierarchical Structure

Flow of Relationships Between Methods

Based on the IFE analysis results, several critical strengths of BSI KC Cimahi support the optimization of QRIS usage, namely: (1) high-quality microfinance human resources that actively conduct educational outreach; (2) the stability of the BSI Mobile platform; and (3) the strength of the Islamic branding owned by BSI, which fosters customer trust. However, there are still significant barriers in the form of internal weaknesses, such as the low level of digital literacy among many merchants, the partial adoption of QRIS by only some merchants, suboptimal

merchant monitoring, and limited coverage of digital campaigns. With an IFE score of 2.60, this analysis shows that BSI's internal strengths are relatively strong but not yet optimal in increasing QRIS transactions.

Based on external factors, the results of the EFE analysis show substantial opportunities, particularly as the trend of non-cash transactions continues to increase along with support from Bank Indonesia at both the national and regional levels. The growth of MSMEs in Cimahi City and the increasing level of public financial inclusion also contribute positively. In recent years, however, BSI has faced several serious competitive threats as e-wallet providers have become increasingly aggressive in dominating the market, consumer communities continue to display cash-based transaction habits, the risks of digital fraud have increased, and internet network quality is often unreliable. The EFE score of 2.38 indicates that BSI KC Cimahi is fairly responsive to the external environment, although its utilization of available opportunities can still be improved.

The integration of internal and external factors through the SWOT matrix indicates that the most fundamental obstacle to QRIS optimization lies in merchants' digital literacy and their limited utilization of QRIS features. This suggests that the WO (Weakness–Opportunity) strategy is the most appropriate to implement, as it addresses the primary weaknesses while simultaneously capitalizing on the most significant opportunities created by the growing trend of digitalization. Therefore, strategies that prioritize digital literacy training, merchant assistance, and QRIS usage optimization can fulfill internal organizational needs while remaining aligned with external development trends.

The QSPM analysis further confirms the findings of the SWOT analysis, indicating that the WO strategy has the highest Total Attractiveness Score (TAS) of 6.24. This demonstrates that the strategy is not only qualitatively relevant but also quantitatively the most attractive compared to other strategies, such as ST, SO, or WT. The WO strategy is considered the most capable of increasing the number of active merchants, expanding QRIS transaction volume, and directly boosting LCF (Low Cost Fund) growth.

In addition, the AHP method provides mathematical confirmation of the QSPM results. The AHP criteria weights identify digital literacy as the most influential factor (0.32), followed by trust (0.20) and ease of use (0.18). This indicates that merchants are not yet fully able to utilize QRIS effectively; therefore, merchant education regarding QRIS usage—supported by strengthening aspects of trust and feature usability—has a strong influence on the effectiveness of strategies aimed at increasing QRIS adoption. A consistency ratio (CR) of 0 for all AHP matrices indicates that the evaluations of the hierarchical structures are consistent and reliable. Furthermore, when the criteria weights are linked to activity and strategy weights, the AHP results also identify the WO strategy as the top priority, thereby reinforcing the conclusion that improving digital literacy is the key factor needed to encourage QRIS optimization at BSI KC Cimahi.

Overall, the analyses conducted through IFE, EFE, SWOT, QSPM, and AHP demonstrate a consistent pattern of findings. The issue of QRIS optimization is not primarily technological in nature; rather, it is more closely related to merchants' understanding of QRIS and their ability to operate it successfully. Therefore, the greatest impact on increasing merchant transactions and subsequently improving LCF sustainably can be achieved through the implementation of educational programs, merchant assistance, digital literacy improvement, and the optimization of QRIS usage.

CONCLUSION

Based on the analysis and discussion, it can be concluded that BSI KC Cimahi has a sufficiently strong institutional and digital foundation to support QRIS utilization through several factors, particularly the stability of the BSI Mobile platform (BSIM) in accommodating user demand, the Islamic brand image perceived as having considerable added value, and the intensive micro-level human resource (HR) education provided to merchants. However, several challenges remain related to digital literacy among merchants, in which some aspects of self-awareness have not yet been fully developed, causing most merchants to operate only at a basic level of QRIS implementation. In addition, BSI KC Cimahi still lacks a monitoring and tracking system for QRIS usage. Updates released through BSIM also do not appear to be fully optimized digitally, as many

merchants continue to operate at relatively low levels overall. Moreover, the IFE, EFE, and SWOT analyses indicate a positive strategic position, suggesting that the branch is on the right path to capitalize on external opportunities such as the cashless movement promoted by Bank Indonesia and support for the growth of MSMEs, while also identifying internal weaknesses and external threats, including competition from e-wallet providers and the risk of digital fraud, both of which represent ongoing real-time challenges alongside the persistence of cash-based transaction habits.

The results of the SWOT and QSPM analyses place the WO strategy in the top position (TAS = 6.24), which emphasizes three major priorities: significant improvements in digital literacy, increased utilization of QRIS, and enhanced micro-level HR assistance supported by optimal QRIS features. This is further supported by the AHP analysis, which recognizes digital literacy as the highest priority, followed closely by trust and ease of use, while identifying digital training and awareness-building as the most prioritized actions. In general, the most influential improvement strategy is education, particularly digital literacy training and optimization, which achieved the highest value. This indicates that long-term digital education supported by operational assistance greatly influences the increase in the number of QRIS transactions and the performance of low-cost funds (LCF) at BSI KC Cimahi.

From a theoretical standpoint, this study contributes to the QRIS adoption literature by providing an integrated strategic framework that combines IFE, EFE, SWOT, QSPM, and AHP within an Islamic banking context. The findings extend Davis's TAM by confirming that digital literacy—rather than perceived usefulness alone—is the dominant adoption barrier for micro banking customers. This contribution bridges a gap in the Islamic fintech literature, where empirical evidence on QRIS optimization strategies remains limited. Practically, the WO strategy framework offers a replicable model for other BSI branches and Islamic microfinance institutions seeking to optimize QRIS adoption and grow their LCF portfolios. The study's limitations include its single-branch scope (BSI Cimahi), the use of a theoretically derived AHP matrix rather than multi-expert empirical pairwise comparisons (with CR = 0 acknowledged), and the cross-sectional data collection period. Future research should conduct longitudinal studies to measure actual LCF growth following strategy implementation and extend the analysis to multiple branches to validate the generalizability of the findings.

ACKNOWLEDGEMENT

The authors sincerely thank PT Bank Syariah Indonesia Cimahi Branch, its management, staff, and participating micro banking customers for their cooperation during data collection, interviews, and field observations. Their support and contributions were essential in providing accurate insights for optimizing QRIS adoption and enhancing the Low Cost Fund portfolio.

AUTHOR CONTRIBUTION STATEMENT

Agung Pramono led the conceptualization, study design, and manuscript drafting. Marimin contributed to field research, data analysis, and interpretation of results. Mimin Aminah assisted in literature review, methodological validation, and manuscript editing. All authors reviewed, revised, and approved the final manuscript, ensuring the integrity and accuracy of the research findings.

REFERENCES

- Adelaja, A. O., Umeorah, S. C., Abikoye, B. E., & Neziyanya, M. C. (2024). Advancing financial inclusion through fintech: Solutions for unbanked and underbanked populations. *World Journal of Advanced Research and Reviews*, 23(01), 427–438. <https://doi.org/10.1016/j.aglobe.2022.100033>
- Ahmad, A. H., Green, C., & Jiang, F. (2020). Mobile money, financial inclusion and development: A review with reference to African experience. *Journal of Economic Surveys*, 34(4), 753–792. <https://doi.org/10.1111/joes.12372>Digital Object Identifier (DOI)
- Bhuiyan, M. R. I., Akter, M. S., & Islam, S. (2025). How does digital payment transform society as a cashless society? An empirical study in the developing economy. *Journal of Science and Technology Policy Management*, 16(4), 756–774.

- Boden, J., Maier, E., & Wilken, R. (2020). The effect of credit card versus mobile payment on convenience and consumers' willingness to pay. *Journal of Retailing and Consumer Services*, 52, 101910. <https://doi.org/10.1016/j.jretconser.2019.101910>
- Brown, M., Hentschel, N., Mettler, H., & Stix, H. (2022). The convenience of electronic payments and consumer cash demand. *Journal of Monetary Economics*, 130, 86–102. <https://doi.org/10.1016/j.jmoneco.2022.06.001>
- Bryson, N., Mobolurin, A., & Ngwenyama, O. (1995). Modelling pairwise comparisons on ratio scales. *European Journal of Operational Research*, 83(3), 639–654.
- David, F. R., David, F. R., & David, M. E. (2017). *Strategic management: concepts and cases: A competitive advantage approach* (Vol. 127). Pearson New Jersey.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 319–340. <https://doi.org/10.2307/249008>
- Ezeh, P. C., & Nwankwo, N. (2018). Factors that influence the acceptance of mobile money in Nigeria. *Journal of Research in Marketing*, 8(2), 684. <https://doi.org/10.17722/jorm.v8i2.217>
- Gathmir, M. (2016). Tinjauan Regulasi Tentang Pembayaran Melalui EWallet. *Journal of Chemical Information and Modeling*, 6(2), 1–9. <https://doi.org/10.1017/CBO.9781107415324.004>
- Hamzah Muchtar, E., Trianto, B., Maulana, I., Alim, M. N., Marasabessy, R. H., Hidayat, W., Junaedi, E., & Masrizal. (2024). Quick response code Indonesia standard (QRIS) E-payment adoption: customers perspective. *Cogent Business & Management*, 11(1), 2316044. <https://doi.org/10.1080/23311975.2024.2316044>
- Hassan, M. A., Shukur, Z., & Hasan, M. K. (2020). An efficient secure electronic payment system for e-commerce. *Computers*, 9(3), 66. <https://doi.org/10.3390/computers9030066>
- Nahwan, D. (2025). The Role of Financial Technology Adoption on Financial Inclusion among Unbanked Populations. *Jurnal Ilmiah Akuntansi Kesatuan*, 13(6), 1725–1736. <https://doi.org/10.37641/jiakes.v13i6.4348>
- Rangkuti, F. (2016). Analisis SWOT Teknik Membedah Kasus Bisnis, PT. Gramedia, Jakarta. In *Academia*. Gramedia Pustaka Utama.
- Sapovadia, V. (2018). Financial inclusion, digital currency, and mobile technology. In *Handbook of Blockchain, Digital Finance, and Inclusion, Volume 2* (pp. 361–385). Elsevier.
- Saputra, A. A., Suhardi, S., & Akbar, J. (2025). The Effect of Digital Literacy, Trust in Security, and Transaction Costs on Optimizing the Utilization of QRIS in MSMEs with Ease of Use as an Intervening Variable. *Economic: Journal Economic and Business*, 4(2), 141–149. <https://doi.org/10.56495/ejeb.v4i2.1001>
- Tavana, M., Soltanifar, M., & Santos-Arteaga, F. J. (2023). Analytical hierarchy process: Revolution and evolution. *Annals of Operations Research*, 326(2), 879–907. <https://doi.org/10.1007/s10479-021-04432-2>
- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view1. *MIS Quarterly*, 27(3), 425–478. <https://doi.org/10.2307/30036540>
- Wijaya, H. (2018). *Perancangan e-payment system pada e-wallet menggunakan kode QR berbasis Android*. Universitas Komputer Indonesia. <https://doi.org/10.34010/ko.mputika.v7i2.1511>
- Wisnubroto, A., & Aprilia, D. (2024). Implementation of Non-Cash Payment Regulations in Indonesian. *Pena Justisia: Media Komunikasi Dan Kajian Hukum*, 23(2), 4666–4684.
- Zulfa, D., & Syahnur, S. (2025). The dynamic effect of cash and non-cash payment instruments on money velocity in Indonesia. *Economic Journal of Emerging Markets*, 57–69. <https://doi.org/10.20885/ejem.vol17.iss1.art5>