

HOW QRIS ECOSYSTEM BECAME INDONESIA'S ACCOUNT-BASED ALTERNATIVE TO CARD-CENTRIC NFC PAYMENTS

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Received: 2026-06-26

Accepted: 2026-09-20

Published: 2026-09-26

Abstract

Indonesia's account-based payment scheme, QRIS (expanded to QRIS Tap in 2025), faces competition from global card-centric wallets, prompting a strategic choice in payment architecture. Because standard technology-acceptance models overlook the geopolitical dimensions prevalent in Indonesian payment discourse, this study extends the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) with two novel demand-side constructs: Sovereignty Perception (salience of domestic control over payment rails and data) and Architecture Preference (favoring account-based over card-centric systems). Using partial least squares structural equation modelling (PLS-SEM), the extended model was tested on 313 Indonesian digital-payment users and triangulated with qualitative interviews, content analysis, and comparative techno-economic analysis. The model explains significant variance in behavioral intention ($R^2 = 0.597$) and use behavior ($R^2 = 0.439$). Habit ($\beta = 0.256$) is the strongest driver of intention, followed by Architecture Preference ($\beta = 0.227$) and Sovereignty Perception ($\beta = 0.184$). These novel constructs outperform classical UTAUT2 antecedents. The non-significant effects of standard predictors (e.g., performance and effort expectancy) indicate a ceiling effect in a habituated market. Findings demonstrate that macro-level sovereignty logic yields micro-level behavioral consequences. Indonesian users actively favor the architecture itself rather than merely adopting available instruments. This research contributes to adoption theory by empirically linking national payment-sovereignty claims to individual adoption behavior.

Keywords: QRIS, Payment Sovereignty, UTAUT2, PLS-SEM, Account-Based Payments.

1. Introduction

Retail payment systems in mature economies evolved along a card-centric path: magnetic-stripe and EMV chip cards, and most recently tokenized Near-Field-Communication (NFC) payments delivered through Apple Pay and Google Pay over the global Visa and Mastercard networks. Systems function by a "pull" logic whereby card credentials traverse a chain of issuers, acquirers and international schemes, accruing comparatively high merchant fees and interchanges (Cohen & Rysman, 2013). Because of decades of consumer habits and terminal investment. The How has advanced economies locked into this design.

Indonesia followed a different path. Instead of extending debit and credit cards, the nation mostly skipped cash to opt for account-based mobile payment because of good penetration of smartphone and the fast-paced growth of local e-money and mobile banking apps. Prior to 2019, the QR-payment market was a mishmash of proprietary and non-interoperable codes that created friction for users and merchants. On 17 August 2019, Bank Indonesia (BI) issued a national standard application QRIS (Quick Response Code



Indonesian Standard) which all licensed providers must use so that any participating application can pay through a common code (Bank Indonesia, 2024). QRIS is a state-driven dominant design: regulation steered the market towards national efficiency, inclusion and sovereignty objectives from an innovation-management perspective.

QRIS was designed to be compatible, accessible and affordable. All the micro-merchant needs are a printed QR identity and a smartphone, without an expensive card terminal. In response to the global convenience benchmark shift towards tap-to-pay NFC, BI introduced QRIS Tap in 2025 which is a NFC front end to enable tap-and-go convenience while maintaining transaction settlement on domestic rails account to account. The strategic stakes are raised by two pressures. To begin with, international card-based wallet services are entering the Indonesian market. Furthermore, the 2025 report of the United States Trade Representative indicated that Indonesia's domestic routing regime (i.e. Gerbang Pembayaran Nasional or National Payment Gateway and the National Standard Indonesian Chip Card Specification or NSICCS) is under external scrutiny as a possible trade barrier (United States Trade Representative, 2025). Indonesia's ultimate payment architecture will determine its payment-fee flow recipient, transaction data controller and whether the tens of millions of countries MSMEs will continue to enjoy near-zero-cost payment acceptance.

This study addresses the demand side of that decision: whether, and why, Indonesian end users choose the account-based QRIS architecture over card-centric NFC, despite a strong user-experience pull toward the global tap-to-pay standard. The question matters theoretically because standard adoption models do not capture the geopolitical dimension that saturates Indonesian payment discourse. The Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) (Venkatesh et al., 2012), contains no construct for the salience of domestic control, nor for a user's comparative judgement between rival payment architectures. We therefore introduce and validate two demand-side constructs Sovereignty Perception and Architecture Preference as antecedents of behavioural intention, net of the established UTAUT2 constructs.

This study is motivated by three gaps. Studies on QRIS adoption in Indonesia that already exist use established acceptance models and explain uptake using conventional convenience, usefulness, security and habit constructs (Kala'Lembang et al., 2024; Muchtar et al., 2024; Rachmad et al., 2024). To the author's knowledge, none make use of the sovereignty dimension that permeates Indonesian payment discourse, nor treat payment choice as a choice between competing architectures rather than adoption of a single instrument. The primary model-based evidence failed to answer the demand-side question of Indonesian users' choice of account-based architecture over card-based NFC.

In principle, the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) (Venkatesh et al., 2012), has no construct for the salience of domestic control over payment rails and data, nor a user's comparative preference between rival architectures. At the same time, the political-economy literature on payment sovereignty occurs at the macro and regulator level and is divorced from micro-level adoption behaviour – therefore, there is no established bridge between the two. At the framework level, Teece's Profiting from Innovation explains how rent capture takes place at the level of the firm, but less addressed is its application to a state or public authority that creates and defends the complementary assets through which payment rent and transaction data are retained onshore, especially in a developing-economy payment system.

The research provides a direct response to the aforementioned gaps: it expands the UTAUT2 framework by incorporating two new demand-side constructs, namely



Sovereignty Perception and Architecture Preference; it empirically tests the validity of the sovereignty argument using primary quantitative data at the individual level; and finally, it extends Teece's value-capture logic from the domain of the firm to that of the state.

The research is guided by one overarching question why do Indonesian users choose account-based QRIS and QRIS Tap over card-based smartphone NFC, and with what consequences for value capture and architecture? decomposed into three research questions: What drives Indonesian end users' intention to use, and actual use of, QRIS and QRIS Tap rather than card-based NFC?; How do QRIS, QRIS Tap and the GPN/NSICCS regime alter who captures the fees and who controls the rails, relative to the global card networks?; Why does an account-based architecture fit Indonesia's infrastructure and MSME-dominated economy better than a card-centric NFC model? The remainder of the paper develops the theoretical framework and hypotheses, describes the mixed-methods design, reports the measurement and structural results alongside supporting evidence, and discusses the theoretical and practical implications.

2. Theoretical Background

2.1 Dominant design, path dependence and value capture

Three innovation-management lenses frame the architectural contest. The dominant-design and path-dependence literatures explain how an architecture achieves critical mass and becomes self-reinforcing through installed-base economics (Abernathy & Utterback, 1978; Arthur, 1989; Henderson & Clark, 1990). Mature markets locked into card-centric rails because terminal investment and consumer habit accumulated switching costs over decades (Cohen & Rysman, 2013). Indonesia's low card-terminal penetration weakened that path dependence and permitted leapfrogging skipping a technological generation (Han & Wang, 2021). QRIS Tap is best read, in Henderson and Clark's (1990) terms, as an architectural innovation that preserves the account-based core while swapping the front-end component (camera-scanned QR) for an NFC radio, extending the domestic design rather than importing card rails.

Teece's (1986, 2018) Profiting from Innovation framework explains who captures the resulting rents. When the appropriability regime is weak as it is for QR and NFC technology, which competitors can readily copy the holder of the dominant complementary assets captures most of the surplus. In Indonesia, BI controls the decisive complementary assets: a nationwide installed base organised around a mandatory open standard, plus the domestic rails (BI-FAST, GPN/NSICCS). This study extends Teece's firm-level logic to the state, treating a public authority as the orchestrator of complementary assets that keep value and data onshore.

2.2 UTAUT2 in the Indonesian QRIS context

UTAUT2 specifies seven antecedents of behavioural intention and use performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value and habit (Venkatesh et al., 2012). Indonesian QRIS adoption studies report an overlapping but uneven profile. Muchtar et al. (2024) found performance expectancy, effort expectancy, social influence and facilitating conditions to predict QRIS adoption intention, while Kala'lembang et al. (2024) identified perceived usefulness and perceived security as the strongest determinants among MSMEs, and other work emphasises trust and habit. A maturation effect is the most plausible reconciliation: in a near-ubiquitous system perceived as useful and easy by almost everyone, these



utilitarian perceptions cease to differentiate adopters from non-adopters. Price value is distinctive in Indonesia, where the blended QRIS merchant discount rate is an order of magnitude below card-NFC friction before terminal rental, so that even a marginally superior card experience may not close the economic gap. Habit warrants emphasis because the information-systems literature treats it as a direct driver of continued use that bypasses deliberative intention (Limayem et al., 2007).

2.3 Two demand-side extensions

Sovereignty Perception (SP) is defined as the salience to a user of domestic control over payment rails and data as a consideration when choosing a payment instrument. It connects the macro political-economy of payment sovereignty to individual behaviour, and is conceptually adjacent to but distinct from consumer ethnocentrism (Shimp & Sharma, 1987): SP concerns control over critical infrastructure rather than a general preference for domestic products. A user for whom domestic control is salient is expected to form stronger intention to use the national account-based instrument.

Architecture Preference (AP) is the comparative judgement that the account-based architecture is preferable to the card-centric alternative. Where SP captures why a user might favour a domestic rail, AP captures the resulting comparative evaluation between the two architectures, operationalising the technology-selection logic at the individual level. A foreseeable objection is that AP is too close to the intention to use QRIS to serve as a predictor of it. The constructs are, however, of distinct types: AP is an attitude toward an object (a relative evaluation of architectures), whereas behavioural intention is a volitional commitment to act and a long tradition in social psychology holds that attitudes toward an object precede and shape behavioural intention.

Integrating these constructs into UTAUT2 yields a model in which nine antecedents (the seven UTAUT2 constructs plus SP and AP) predict behavioural intention (BI), which in turn predicts use behaviour (UB). Following standard mediation practice, the model is deliberately saturated: each antecedent is also specified with a direct path to UB, permitting an explicit test of intention's mediating role. The core hypotheses are:

H1–H9: Performance expectancy (H1), effort expectancy (H2), social influence (H3), facilitating conditions (H4), hedonic motivation (H5), price value (H6), habit (H7), Sovereignty Perception (H8) and Architecture Preference (H9) each positively influence behavioural intention to use QRIS/QRIS Tap. H1–H7 are conditioned by market maturity; H8 and H9 are the study's novel demand-side hypotheses.

H16, H19: Habit (H16) and behavioural intention (H19) positively influence use behaviour directly.

H20, H28: Behavioural intention mediates the effects of Architecture Preference (H20) and Sovereignty Perception (H28) on use behaviour.

The remaining direct paths to use behaviour (H10–H15, H17–H18) and the remaining mediation paths (H21–H27) complete the saturated specification and are reported in full in the results.

2.4 Contribution of the study

In light of these gaps and frameworks, this study sets out four contributions. The most prominent contribution of this study is that it brings into the technology adoption literature two demand side constructs Sovereignty Perception, which is the salience to a user of domestic control over the payment rails and the data; and Architecture Preference,



which is the comparative judgement that favours the account-based architecture as antecedents of behavioral intention, net of the established UTAUT2 constructs. In establishing a link between the macro-level political economy of payment sovereignty to the micro-level of adoption behavior, the proposal provides a mechanism by which a lobby logic usually asserted at the regulator level can be shown to operate, and to matter, at the level of the individual user.

Furthermore, it broadens Teece's Profiting from Innovation framework from the firm to the state, conceptualizing a public authority as the orchestrator of the complementary assets an open, mandated, EMVCo-aligned standard, domestic switching, and a real-time interbank rail that determine who captures payment rent and where transaction data reside. In addition, to better understand how QRIS features impact demand, it will document the decision of a user to access a QRIS, which may be done to access a new architecture, as opposed to simply chasing an instrument.

The concept of leapfrogging implies Indonesia has leapt a business model, namely, from a credit-and-interchange card paradigm to an account-based, real-time push-payment paradigm rather than a technological generation. At the individual level, there is support for a bifurcated dominant design, with the Global North remaining card-centric while parts of the Global South converge on account-based architectures. We will go through it empirically in the sections that follow

3. Methods

3.1 Research Design

The study uses an embedded mixed-methods design with a dominant quantitative strand and a supporting qualitative component, anchored in a pragmatist paradigm in which the research question, not a prior ontological commitment, governs method choice (Creswell & Creswell, 2017). The quantitative end-user questionnaire carries the inferential weight and is the sole basis for hypothesis testing; the qualitative and secondary materials add interpretive depth and technical mechanism, corroborating rather than independently testing the model. An embedded rather than a fully convergent design is appropriate because the qualitative strand is intentionally narrow and confirmatory.

3.2 Sample and data collection

The target population is Indonesian users of digital-payment services with experience of QRIS, QRIS Tap and card-centric NFC. In the absence of a sampling frame for such users, a self-administered online questionnaire was distributed using non-probability purposive and convenience sampling, yielding 313 valid responses after screening for prior QRIS experience and checking for missing values, straight-lining and out-of-range entries. The realised sample exceeds the minimum required by both the ten-times rule (90 cases for the nine paths converging on behavioural intention) and the inverse-square-root method (approximately 275 cases to detect $\beta = 0.15$ at 80% power), and so supports stable estimation; the two smallest significant paths ($\beta \approx 0.11$) sit near the detection limit and are interpreted accordingly (Hair et al., 2022).

The sample skews young (90.4% aged 18–34), female (74.1%), educated (61.3% holding a bachelor's degree), Android-using (76.7%) and highly habituated (80.2% with more than one year of QRIS tenure). This profile is appropriate for studying the technology-selection behaviour of the digitally active cohort that dominates QRIS usage, but constrains population-level generalisation, as noted in the limitations. Table 1 summarises the respondent profile.



Table 1. Respondent profile (N = 313). Percentages may not sum to 100 due to rounding.

Variable	Category	n	%
Age	18–24 / 25–34	283	90.4 (combined)
Gender	Female	232	74.1
Education	Bachelor (S1)	192	61.3
Monthly income	< IDR 5 million	206	65.8 (combined)
Smartphone OS	Android	240	76.7
NFC-capable device	Yes	280	89.5
QRIS tenure	> 1 year	251	80.2
Used QRIS Tap	Yes	250	79.9
Used card-NFC wallet	Yes	202	64.5

Source: Data processed by researchers (SPSS v.27), 2026

The supporting qualitative material comprised a semi-structured interview with a payment-technology engineer experienced in iOS-NFC, EDC-acquiring and card-rails integration on Indonesian infrastructure who is also a registered QRIS micro-merchant and a semi-structured interview with the owner of a micro-enterprise coffee shop in the sub-IDR-500-million MSME tier. Five open-ended questionnaire items (165–284 valid responses each) supplied a third qualitative source. A secondary techno-economic strand drew on BI and ASPI regulations and statistics, QRIS/QRIS Tap and EMVCo specifications, the USTR report, and reputable industry and media reporting.

3.3 Measures and analysis

The model comprises eleven latent variables measured by thirty-one reflective indicators on Likert scales: nine antecedents (the seven UTAUT2 constructs plus SP and AP), behavioural intention as mediator, and use behaviour as outcome. The structural model was estimated in SmartPLS using Mode A reflective measurement and a path-weighting scheme, with significance assessed by bootstrapping. A two-stage procedure was followed: the measurement model was evaluated for indicator reliability (outer loadings), internal-consistency reliability (Cronbach's α and composite reliability ≥ 0.70), convergent validity (average variance extracted, AVE ≥ 0.50) and discriminant validity (Fornell–Larcker criterion and the more conservative heterotrait–monotrait ratio, HTMT); the structural model was then assessed for collinearity, path significance, R^2 , effect size f^2 and out-of-sample predictive relevance Q^2 (Fornell & Larcker, 1981; Hair et al., 2022; Henseler et al., 2015). Paths were treated as supported where $t > 1.96$ and $p < 0.05$. The interview transcripts and open-ended responses were analysed by thematic and inductive content analysis (Braun & Clarke, 2006), and the secondary material by a transaction-stack comparative techno-economic analysis that decomposes a representative transaction into its cost layers, traces the destination (domestic or foreign) of each layer, and identifies the control points for the rail, the standard and the data.

4. Results and Discussion

4.1 Measurement model

All eleven constructs met the thresholds for convergent validity and composite reliability. Indicator loadings ranged from 0.702 (PE5) to 0.889 (HB4), composite reliability from 0.807 to 0.917, and AVE from 0.616 to 0.734 (Table 2). For three two-indicator constructs facilitating conditions, architecture preference and use behaviour Cronbach's α fell modestly below 0.70 (0.523, 0.544 and 0.534), which is expected for



short scales given that α systematically under-estimates reliability for few items; the corresponding composite reliabilities (0.807, 0.813, 0.809) confirm acceptable reliability and the modest α values are reported transparently rather than suppressed.

Table 2. Construct reliability and convergent validity. Thresholds: $\alpha \geq 0.70$; CR ≥ 0.70 ; AVE ≥ 0.50 . $\sqrt{\text{AVE}}$ reported for the Fornell–Larcker assessment.

Construct	Items	α	CR	AVE	$\sqrt{\text{AVE}}$
Performance Expectancy	3	0.685	0.827	0.616	0.785
Effort Expectancy	3	0.755	0.858	0.669	0.818
Social Influence	3	0.725	0.845	0.647	0.804
Facilitating Conditions	2	0.523	0.807	0.676	0.822
Hedonic Motivation	3	0.695	0.830	0.619	0.787
Price Value	3	0.699	0.833	0.624	0.790
Habit	4	0.879	0.917	0.734	0.857
Sovereignty Perception	3	0.769	0.866	0.684	0.827
Architecture Preference	2	0.544	0.813	0.685	0.828
Behavioural Intention	3	0.739	0.853	0.660	0.812
Use Behaviour	2	0.534	0.809	0.680	0.825

Source: Data processed by researchers (SPSS v.27), 2026

The Fornell–Larcker criterion was satisfied: the square root of AVE exceeded each construct’s correlations with all others. The HTMT ratio, however, exceeded 0.90 for three pairs behavioural intention–use behaviour (0.972), effort expectancy–hedonic motivation (0.962) and performance expectancy–hedonic motivation (0.951) with several further pairs in the 0.80–0.87 range. In this highly habituated sample, users do not psychologically separate “useful”, “easy” and “enjoyable”, nor sharply distinguish “intend to use” from “do use”. This collinearity limits the discriminant validity of the utilitarian/hedonic cluster and is reported openly; importantly, it does not affect the constructs carrying the main effects Habit, Sovereignty Perception and Architecture Preference which remain empirically distinct. The non-significant utilitarian paths reported below should therefore be read as collinearity-affected rather than as evidence that those perceptions are irrelevant.

4.2 Structural model

The model explains a large share of behavioural intention ($R^2 = 0.597$) and a moderate share of use behaviour ($R^2 = 0.439$), with satisfactory combined predictive relevance ($Q^2 = 0.774$). Of the nine antecedents of intention, five are significant: Habit ($\beta = 0.256$), Architecture Preference ($\beta = 0.227$), Sovereignty Perception ($\beta = 0.184$), Price Value ($\beta = 0.112$) and Facilitating Conditions ($\beta = 0.105$). Performance expectancy, effort expectancy (negative sign), social influence and hedonic motivation are non-significant. For use behaviour, only behavioural intention ($\beta = 0.425$) and Habit ($\beta = 0.251$) are significant direct drivers. Effect sizes confirm the ranking: on intention, Architecture Preference ($f^2 = 0.088$), Habit (0.081) and Sovereignty Perception (0.052) make the largest marginal contributions. Table 3 reports the direct paths and hypothesis decisions. **Table 3. Key structural paths and hypothesis decisions ($t > 1.96$ and $p < 0.05$ = supported). $R^2(\text{BI}) = 0.597$; $R^2(\text{UB}) = 0.439$; $Q^2 = 0.774$. Remaining direct paths to use behaviour (H10–H15, H17–H18) were non-significant.**

H	Path	β	t	p	Decision
H1	PE $\rightarrow$ BI	0.107	1.543	0.123	Not supported
H2	EE $\rightarrow$ BI	−0.086	1.378	0.169	Not supported



H	Path	β	t	p	Decision
H3	SI $\rightarrow$ BI	0.039	0.848	0.397	Not supported
H4	FC $\rightarrow$ BI	0.105	2.042	0.042	Supported
H5	HM $\rightarrow$ BI	0.105	1.593	0.112	Not supported
H6	PV $\rightarrow$ BI	0.112	2.166	0.031	Supported
H7	HB $\rightarrow$ BI	0.256	3.481	0.001	Supported
H8	SP $\rightarrow$ BI	0.184	3.756	0.000	Supported
H9	AP $\rightarrow$ BI	0.227	4.921	0.000	Supported
H16	HB $\rightarrow$ UB	0.251	3.449	0.001	Supported
H19	BI $\rightarrow$ UB	0.425	5.725	0.000	Supported

Source: Data processed by researchers (SPSS v.27), 2026

4.3 Mediation

Behavioural intention significantly mediates four antecedents: Architecture Preference (indirect $\beta = 0.097$, $p < 0.001$), Habit (0.109, $p = 0.004$), Sovereignty Perception (0.078, $p = 0.003$) and Price Value (0.047, $p = 0.038$). For Sovereignty Perception and Architecture Preference the mediation is full their direct paths to use are non-significant while their indirect paths are significant meaning that both constructs shape actual use entirely by raising intention. This is precisely the mechanism the technology-selection logic predicts: a comparative preference for the architecture, and the salience of domestic control, translate into behaviour through deliberate intention rather than through automatic use.

4.4 Open-ended corroboration

Inductive content analysis of the open-ended items corroborated the structural findings in respondents' own words. Practicality and ease were the dominant stated reasons for using QRIS (84.5% of 284 valid responses), mapping onto Price Value and Habit rather than abstract usefulness. The leading frustration was connectivity signal, internet or data-quota failure at the moment of payment (53.4% of 279 responses) followed by slow or failed transactions (28.3%); fraud or data-security concerns were nearly absent (3.9%). Users' lived problem with the account-based architecture is therefore its online dependence, not its safety, which independently substantiates a connectivity ceiling for QRIS Tap and undercuts the claim that card-NFC tokenisation security is a salient demand-side advantage. The preference structure was strikingly asymmetric: 54.2% would switch from Scan to Tap (upgrading the front end while retaining the architecture), but only 16.4% would prefer Apple or Google Pay, with 61.1% explicitly declining. Among reasons for staying, 24.2% spontaneously cited national or local pride and 20.9% cited trust in Bank Indonesia unprompted verbal corroboration of the significant Sovereignty-Perception path.

4.5 Value capture and ecosystem fit (supporting evidence)

The techno-economic strand addresses RQ2 and RQ3. Under QRIS, the merchant discount rate (MDR) for the micro tier is zero below the IDR 500,000 threshold, and where a non-zero 0.7% rate applies it is split among domestic actors (approximately 40% to the issuing provider, 50% to the acquiring provider and 10% to the switch), with the central bank taking no rent. The card-centric stack concentrates rents in three layers interchange to a largely foreign-affiliated issuer, network assessment to Visa or Mastercard, and a wallet-platform fee so that an estimated 85% of the merchant's MDR



is exported. A deliberately conservative order-of-magnitude counterfactual, applying a 2% card-style MDR and a 70% foreign-capture share to 2025 QRIS value, implies on the order of IDR 30 trillion (approximately USD 1.9 billion) in payment rent retained domestically each year that a card-NFC counterfactual would have directed offshore; including GPN/NSICCS debit routing, the full-system figure plausibly reaches USD 3–4 billion. Because transaction volume is endogenous to the architecture, this figure is best treated as an order of magnitude rather than a precise estimate (Table 4).

Table 4. Order-of-magnitude counterfactual estimate of 2025 domestic payment-rent retention. Figures depend on stated assumptions and should be read as indicative.

	Card-NFC counterfactual	QRIS actual	Difference
2025 QRIS value (IDR)	~2,200 trillion	~2,200 trillion	
Effective MDR assumed	2.0% (conservative)	~0.3% blended	–1.7 pp
Total MDR pool (IDR)	~44 trillion	~6.6 trillion	–37.4 trillion
Foreign-export share	70%	0%	–70 pp
Foreign-exported rent	~30.8 trillion (~USD 1.9bn)	0	~USD 1.9bn retained

Source: Data processed by researchers (SPSS v.27), 2026

Two control mechanisms underpin this retention. The NSICCS/GPN regime routes a Visa- or Mastercard-marked Indonesian debit card through domestic switches (Jalin, Rintis, Artajasa, ALTO) when it is used onshore, while the same card reverts to international rails abroad; on-us debit then costs roughly 0.15% against about 2% for direct international routing. The expert interview confirmed this dual-switching architecture in technical detail and identified it as the real economic content behind the USTR’s characterisation of QRIS and GPN as trade barriers: the card networks are not excluded from Indonesia but are barred from the national interchange surplus. The merchant interview corroborated the acceptance-side economics directly the owner paid zero MDR, set no cash-versus-QRIS price difference, and had recently deactivated his card EDC because card use had fallen to nil, confirming the firm-level mechanism behind the missing-complementary-asset diagnosis.

On ecosystem fit, the account-based design draws on assets Indonesia already possesses a smartphone-first, Android-dominant base and a real-time interbank rail rather than the dense card-terminal network that mature economies built over decades. The MSME tier, which median tickets place well below the micro threshold and whose working-capital cycles are measured in hours, functioned as a demand-side selection mechanism: no plausible pricing path would let card-NFC serve this segment without permanent subsidy. The realistic equilibrium is therefore segmented coexistence QRIS dominant in mass-market retail, card-NFC persistent in premium, transit and cross-border niches, and QRIS Tap contesting proximity retail and transit consistent with a bifurcated dominant design in which the Global North remains card-centric while parts of the Global South converge on account-based architectures alongside India’s UPI and Brazil’s Pix.

4.6 Discussion

The three research questions converge on one conclusion: for the Indonesian mass market, the account-based architecture is the stronger strategic choice, and its defensibility rests on attributes the card model cannot easily replicate. On RQ1, the



demand-side ordering of intention drivers' habit, architecture preference, sovereignty perception, price value and facilitating conditions inverts the usual adoption story. The classical utilitarian and social constructs are inert, deactivated by ceiling effects and collinearity in a habituated market, while actual use is driven directly only by intention and habit. The architecture out-selects card-NFC on cost, device requirements and settlement speed, and behaviourally on habit, an explicit preference for the architecture, and sovereignty. Its single identified vulnerability is connectivity dependence in high-throughput proximity use, the one dimension on which an offline tokenised card tap retains a genuine functional edge.

On RQ2, the account-based design and the NSICCS/GPN regime materially redistribute value capture and control toward domestic actors, keeping the MDR onshore and splitting it competitively, against a card stack those exports most of it. Crucially, the significant Sovereignty-Perception path shows that this supply-side logic is legible to and valued by end users, connecting RQ2 back to RQ1. On RQ3, the architecture fits because it leverages existing complementary assets and because the MSME economy selected it; QRIS Tap extends rather than replaces the design.

The study makes four contributions. First and most distinctive, it introduces and empirically validates two demand-side constructs Sovereignty Perception and Architecture Preference and shows that both predict adoption intention net of the established UTAUT2 constructs, with full mediation through intention. This links the macro-level political economy of payment sovereignty to micro-level adoption behaviour, demonstrating that a sovereignty logic usually argued at the regulator level is behaviourally consequential for ordinary users, who prefer the architecture itself rather than merely adopting an available instrument. Second, it extends Teece's Profiting from Innovation framework from the firm to the state, showing how a public authority creates and defends the complementary assets that keep value and data onshore. Third, it offers evidence for a bifurcating global payments landscape in which the Global North remains card-centric while parts of the Global South converge on account-based architectures. Fourth, it refines the concept of leapfrogging: Indonesia leapt not merely a generation of technology but a business model from a credit-and-interchange card paradigm to an account-based, real-time push-payment paradigm.

For practice, the demand-side evidence implies that the marginal return to further user-experience engineering of QRIS Tap is lower than the return to three other levers: protecting the cost advantage by preserving low or zero MDR for MSMEs, since price value drives adoption while usefulness and ease are inert; hardening the one identified vulnerability through an offline or on-device authorisation capability for transit and high-throughput settings; and sequencing the QRIS Tap roll-out toward cohorts where a scanning habit has not yet formed above all public transport because entrenched habit both protects QRIS-Scan and raises the internal switching cost to Tap. The significant sovereignty and architecture-preference paths further suggest that domestic-control positioning is a real, if not unlimited, demand-side asset that communication can legitimately draw on. The unresolved restriction on third-party iOS NFC access remains the largest external constraint on QRIS Tap's reach and is a matter for negotiation with the device platform

5. Conclusion

Indonesia's account-based architecture is best understood not as a defensive substitute for card-centric NFC but as a distinct dominant design selected on the demand side for



its cost, its fit with a smartphone-first MSME economy, its entrenched habit, and the measurable value users place on domestic control and on the architecture itself. QRIS Tap extends that design to proximity payments. The principal strategic task ahead is to harden the architecture against its one real vulnerability, connectivity dependence, while preserving the cost advantage and sovereign control that the demand-side evidence shows users actually value.

Several limitations bound these conclusions. The questionnaire used a non-probability online sample skewed toward young, female, educated, Android-using and highly habituated respondents, which constrains causal and population-level generalisation; the cross-sectional design cannot establish the causal direction of the habit–use association; and the discriminant-validity collinearity among the utilitarian and hedonic constructs limits interpretation of the non-significant paths. The qualitative strand is intentionally narrow one expert and one micro-merchant and is corroborative rather than independently generalisable; larger and higher-throughput merchant segments are absent. QRIS Tap is recent, so long-run market-effect data are scarce, and the techno-economic counterfactual is an order-of-magnitude estimate sensitive to its assumptions.

Future research should pursue a longitudinal or panel design to test causal direction, a probability or quota sample extending to older, lower-income and rural non-users, and a dedicated multi-tier merchant study with in-depth end-user interviews to permit a full convergent mixed-methods replication. Dedicated scale-development work expanded item pools, confirmatory validation, and tests of discriminant validity against related attitudes such as consumer ethnocentrism would consolidate the psychometric status of Sovereignty Perception and Architecture Preference. A comparative study of account-based architectures across the Global South (UPI, Pix, and domestic-switching schemes such as mada, MyDebit and NAPAS) would test the bifurcated-dominant-design hypothesis directly, and a field study of QRIS Tap at transit gates would quantify the connectivity constraint this study identifies as decisive

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