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OPEN BANKING SERVICE DEVELOPMENT STRATEGY TO ENHANCE DIGITAL ECOSYSTEM COLLABORATION

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Abstract

Indonesia's Open Banking sector has grown rapidly under the National Open API Payment Standard (SNAP). The Payment System Blueprint (BSPI) 2025/2030 and the 2022 Personal Data Protection Law have governance gaps affecting financial data integrity and regulatory compliance within banking accounting information systems (AIS). This study aims at mapping the ecosystem's governance architecture, identifying external driving forces, and proposing reconfiguration strategies for digital collaboration. A qualitative case study design was used, drawing on ten purposively selected informants from industry associations, banks, and fintech Payment Service Providers, and analysed thematically using NVivo 15. Findings reveal a multi-layered orchestration structure: Bank Indonesia as macro-orchestrator, ASPI as a meso-actor Self-Regulatory Organization, banks as micro-orchestrators, and fintech as ecosystem enablers, connected through five value flows in which trust is the fundamental precondition. The study contributes an unmodelled meso-actor SRO layer to Business Ecosystem Architecture theory and seven grounded reconfiguration strategies for Indonesia's Open Banking governance.

INTRODUCTION

Financial services worldwide look quite different today than they did a decade ago, largely because third-party providers (TPPs) can now reach into customer financial data through Application

Programming Interfaces (APIs). That shift has redrawn the line between banks and fintech firms and, with it, opened room for financial products that simply were not feasible before (Babin & Smith, 2022; Odorović, 2023). The same shift lets customers tap into services built from information passed between institutions and outside parties they trust, something European and Asia-Pacific markets have already shown in some detail (Liao et al., 2022; Shacheendran et al., 2025).

From the viewpoint of banking accounting information systems (AIS), the governance of Open Banking has a considerable impact on the quality, correctness, and reliability of financial data used in accounting and reporting procedures. The quality of AIS is directly related to the accuracy, timeliness, consistency, and reliability of financial reporting. Information technology effectiveness and system quality capabilities improve financial reporting outcomes (Diaha et al., 2026; Hadiyat, 2020; Michael & Widjaja, 2024). SNAP establishes the technical, security, data, and governance requirements for Open API payment services in Indonesia. These requirements include communication protocols, data structures, authentication, authorization, encryption, access management, and consumer and data protection (Bank Indonesia, 2021). These standards and governance methods thereby influence the dependability and correctness of the transaction data mediated via APIs, which in turn is the basis of accounting and financial information systems. Moreover, the digital transformation of accounting using advanced technologies such as cloud computing, cybersecurity, blockchain, etc. has been associated with higher reliability and transparency of financial data and reporting (Tiron-Tudor et al., 2022).

Three regulatory pillars hold up Indonesia's version of this story. Bank Indonesia built the first, the National Open API Payment Standard, or SNAP, as a common technical language for connecting financial service providers; as of June 2024, some 71 Payment Service Providers (PSPs) and about 6,667 users had taken it up, pushing transaction values to IDR 3,069 trillion across 6,217 million transactions (Bank Indonesia, 2024). The Indonesia Payment System Blueprint (BSPI) for 2025 and 2030 forms the second pillar, charting where the national payment system's digitalization is headed (Bank Indonesia, 2024), while the third is Law No. 27 of 2022 on Personal Data Protection (UU PDP), aimed at keeping customer information secure and handled in the open (UU PDP Indonesia, 2022).

None of this is small in scale. Worldwide, Open Banking transaction values are expected to roughly quintuple between 2023 and 2027, moving from USD 57 billion up to USD 330 billion (Thakor, 2020). Indonesia's own digital payment figures tell a similar story: a climb from USD 100 billion in 2018 toward a projected USD 704.46 billion by 2030, north of 600 percent growth (Bank Indonesia, 2024), and the country already sits ahead of Malaysia, Singapore, Thailand, and the Philippines in point-of-sale and digital commerce payment values across Southeast Asia (Bank Indonesia, 2024; Ozili, 2018).

Even so, the research base explaining how Open Banking ecosystems form and hold together is uneven. Three broad streams of empirical work can be picked out, each useful in its own way, though none quite finishes the picture on its own.

The first concerns itself with regulatory architecture: how national authorities draft the technical standards and consent rules that govern data exchange between banks and third parties (Babin & Smith, 2022; Billiam, 2022). Its weak point is that regulation tends to come across in this literature as something simply imposed from above, with little said about how bodies such as industry associations turn broad policy into working compliance day to day. That leaves a hole in our understanding of how layered governance ends up shaping collaboration across an entire ecosystem (Sugarda & Wicaksono, 2023; Zachariadis & Ozcan, 2017).

A second stream sits closer to questions of competition and innovation between banks and fintech firms, charting how Open Banking reshuffles market position and drives service innovation (Noviaristanti, 2021; Odorović, 2023; Shacheendran et al., 2025). It establishes well enough that competitive pressure has grown but has less to offer on the value exchanges that tie banks, fintech, and regulators into one ecosystem rather than a string of rival pairs. Competitive analysis by itself, then, falls short of capturing how interdependent these actors structurally are.

The third stream turns to Business Ecosystem Architecture for mapping actor roles, boundaries, and value flows inside digitally mediated business ecosystems (Ma et al., 2021; Tricahyono & Purnamasari, 2018), often alongside the ecosystem collaboration typology that sorted actors into

Orchestrator, Dominator, Complementor, and Protector roles (Kamalaldin et al., 2021). Where this stream fell short was scale: applications so far have stuck to single-firm or single-product settings, electric vehicle charging networks and SME value chains among them, with nothing yet attempted at the level of a national, multi-regulator financial ecosystem like Indonesia's.

Line these three streams up, and a gap stands out plainly. Regulation, competition, and ecosystem theory keep being studied as separate concerns, so how their interaction produces an integrated, multi-layered orchestration structure has gone largely uncaptured (Billiam et al., 2022; Ma et al., 2021). The Indonesian case makes this gap sharper still: SNAP has delivered a measure of regulatory standardization, yet the surrounding ecosystem stays fragmented, still missing the kind of single national directory and consent model that more established markets, the United Kingdom, Australia, and Singapore have already put in place (Sugarda & Wicaksono, 2023; Zachariadis & Ozcan, 2017). It is that combination- the empirical gap and the thin theoretical purchase it leaves on how Indonesia's Open Banking ecosystem is structured and governed- that this study sets out to address.

But from the AIS standpoint, there is an additional gap. Previous Open Banking studies are mostly on regulation, competition, innovation, or ecosystem collaboration. AIS studies often focus on information quality, internal control, financial reporting, and digital transformation within organizational boundaries. There has been less focus on the impact of Open Banking governance on the quality and control of accounting information when transaction data is shared across banks, fintech PSPs, and API-based infrastructure. In this paper, the authors have addressed this intersection by studying Open Banking as an inter-organizational financial information environment for Banking AIS.

The analysis draws on the Business Ecosystem Architecture framework boundary identification, actor and role mapping, value proposition analysis, and value flow identification (Ma et al., 2021) alongside the ecosystem collaboration typology proposed by Kamalaldin et al. 2021). Both sit comfortably within digital economy theory, where data and platform standardization function as strategic assets steering competitive behaviour across networked industries (Gomber et al., 2018). Combined, these perspectives offer a way to read how regulatory, competitive, and architectural forces come together to shape ecosystem-wide orchestration, which Figure 1 attempts to lay out visually.

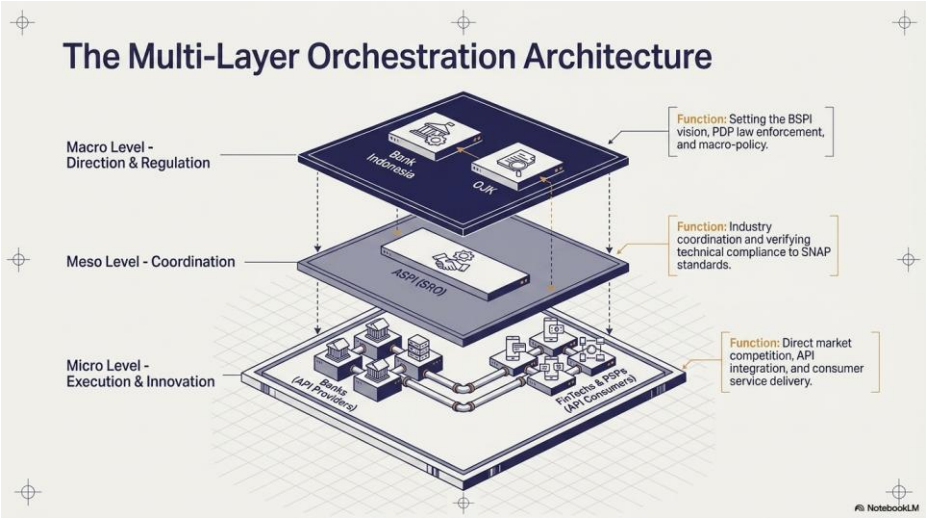


Figure 1. Conceptual Framework of Indonesian Open Banking Ecosystem Orchestration

As presented in Figure 1, Bank Indonesia, OJK, and ASPI occupy the regulatory and meso-actor tiers sitting above banks and fintech at the operational level, with value flows threading through every layer and external forces nudging the whole arrangement toward reconfiguration as time goes on.

Taking this theoretical base and the gap it points to as a starting point, the study works through how regulatory standardization, actor orchestration, and value flows together give shape to the Indonesian Open Banking ecosystem. From the Banking AIS viewpoint, the analysis also looks at how

ecosystem governance impacts transaction data integration, validation, reconciliation, security, auditability, and regulatory reporting. These factors link ecosystem-level Open Banking agreements with the dependability of accounting information generated and processed by banking institutions. Three questions frame the inquiry:

RQ1: *"How can the structure and interaction patterns of the Indonesian Open Banking ecosystem be described through ecosystem mapping?"*

RQ2: *"What external driving forces influence the growth and sustainability of the Indonesian Open Banking ecosystem?"*

RQ3: *"What reconfiguration strategies can be formulated for the Indonesian Open Banking ecosystem development?"*

METHOD

This study employs a qualitative case study design (Creswell & Poth, 2018). The case is defined as the governance architecture of Indonesia's national Open Banking ecosystem, bounded by SNAP's regulatory domain and the BSPI 2025 strategic period, a scope that is analytically tractable with purposive qualitative sampling and that reflects the institutional boundaries within which the ecosystem currently operates. The unit of analysis encompasses the ecosystem's regulatory, operational, and value-flow dimensions rather than any single organization or dyadic relationship.

10 informants were selected through purposive sampling designed to cover every structural layer of the ecosystem's governance architecture: one from the industry association (ASPI), seven from banks spanning BUKU 4, BUKU 3, Islamic banking, and digital banking segments, and two fintech Payment Service Providers representing Category 1 and Category 2 PSPs. This structural coverage follows the theoretical sampling logic of Miles et al. (2020), with data collection continuing until thematic saturation was reached, confirmed after the eighth informant, with N9 and N10 corroborating rather than extending prior themes.

Direct BI and OJK officials declined participation citing institutional communication protocols, a common constraint in regulatory research in Indonesia (Sugarda & Wicaksono, 2023). Three compensatory triangulation strategies were applied: first, N1 (ASPI), in a Secretary-General-level role with direct working relationships with both BI's Payment System Policy Department and OJK's Digital Finance Supervision unit, served as a substantive proxy and was able to articulate regulatory intent from direct institutional interaction; second, all regulatory positions attributed to BI and OJK were verified against 23 official documents including BSPI 2025/2030, SNAP Technical Standard v2.0, POJK No. 13/2018, and POJK No. 77/2016; third, informant accounts of regulatory requirements (N2, N4, N7) were cross-checked against the official document corpus for consistency. This limitation is acknowledged explicitly in the Conclusion section.

Primary data came from in-depth interviews and focus group discussions (FGDs), guided by an interview protocol covering six thematic areas: ecosystem boundary identification, actor and role mapping, value proposition identification, interaction and data flow analysis, influential external factors, and ecosystem reconfiguration strategies. Secondary data from BSPI 2025/2030, SNAP guidelines, UU PDP, and official publications from Bank Indonesia, OJK, and ASPI were analysed following document analysis procedures and systematically cross-referenced with informant accounts throughout the Results. The informant profile appears in Table 1.

Data analysis followed Miles et al.'s (2020) qualitative data analysis framework, comprising data condensation, data display, and conclusion drawing and verification. Thematic coding was conducted using NVivo 15 through three sequential stages. First, open coding of 12 interview and 2 FGD transcripts (approximately 180,000 words in total) generated 187 initial codes. Second, axial coding examined relationships among the initial codes and consolidated them into 24 sub-categories across the six protocol themes. Third, selective coding integrated these sub-categories with the Business Ecosystem Architecture framework, resulting in five core analytical categories: ecosystem boundary, actor-role structure, value flows, external driving forces, and reconfiguration strategies. Moreover, to enhance the credibility and trustworthiness of the findings, source and methodological triangulation

were systematically conducted. Source triangulation compared evidence across three actor groups: regulatory/SRO participants (N1), banking institutions (N2–N8), and fintech PSPs (N9–N10) to identify convergence, partial convergence, and divergence in perceptions of governance, value flows, ecosystem relationships, and strategic responses. Furthermore, Convergent accounts were treated as stronger evidence of shared ecosystem conditions, while divergent accounts were retained and examined in relation to actors' distinct roles, interests, and positions within the ecosystem.

Methodological triangulation was conducted by cross-validating primary evidence from interviews and FGDs against secondary documentary sources, including the Blueprint Sistem Pembayaran Indonesia (BSPI), SNAP technical standards, and relevant POJK regulations. Documentary evidence was used both to corroborate informant accounts and to identify discrepancies between formal regulatory requirements and participants' experienced implementation practices; such discrepancies were retained as analytical findings and examined in relation to governance and implementation gaps. In addition, member checking was conducted with selected key informants (N1, N4, and N7), who reviewed preliminary interpretations and emerging analytical categories and provided confirmation, correction, or refinement. Analytical consistency was further strengthened through peer debriefing with a second independent coder, who independently coded two transcripts and achieved 84% code agreement with the primary researcher. Coding differences were discussed and resolved through consensus, with code definitions and boundaries refined where necessary.

Table 1. Research Informant Profile

Code	Actor Category	Data Collection Method
N1	SRO (ASPI)	In-depth Interview
N2	BUKU 4 Bank	In-depth Interview
N3	BUKU 3 Bank	In-depth Interview
N4	BUKU 3 Bank	In-depth Interview
N5	Islamic Bank	FGD
N6	Digital Bank	FGD
N7	BUKU 3 Bank	In-depth Interview
N8	Digital Bank	In-depth Interview
N9	PJP Category 2	In-depth Interview
N10	PJP Category 1	In-depth Interview

RESULTS

Two dimensions describe where Indonesia's Open Banking ecosystem begins and ends. One is the target domain:s digital, API-based payment systems within banking, plus the Payment Service Providers that SNAP regulates. The other is geographic, set by national law: BSPI 2025/2030 maps out the long-term strategy, and UU PDP 2022 protects the rights attached to consumer data. SNAP's transaction volume figures (Bank Indonesia, 2024) IDR 3,069 trillion across 6,217 million transactions) corroborate informant accounts of the post-SNAP ecosystem scale and confirm that SNAP has become the de facto technical boundary of the ecosystem.

Running the interview transcripts through NVivo produces a word cloud dominated by two terms, 'SNAP' and 'API' by a wide margin, confirming that technical standardization functions as the primary mechanism regulating ecosystem access and interaction. Exactly how a given bank applies these boundaries, though, comes down to its own risk appetite and strategic posture. N2 describes a multi-layered vetting process: 'We check the legal entity it must be running for more than one year. Then ownership structure, directors, or CEO background. These are all checked.' N5 adds a domain-specific layer: 'Every product we collaborate on must be Sharia-compliant by design; it goes to the Sharia Supervisory Board for approval before we can proceed.' N8 reflects yet another boundary logic: 'We divide partners into two categories: those within the Astra Financial ecosystem, where trust is pre-

established, and external partners, where we apply full due diligence from scratch.' These divergent boundary practices, all operating within SNAP's overarching technical framework, confirm that ecosystem governance in Indonesia operates through nested, actor-specific compliance layers rather than a uniform access protocol, a finding with no parallel in the UK, Australian, or Singaporean Open Banking literature. Figure 2 presents the resulting NVivo word cloud, and Table 2 summarizes the boundary criteria banks apply when vetting prospective partners.



Figure 2. Word Cloud of Open Banking Ecosystem Boundary — NVivo 15 Analysis

Table 2. Collaboration Boundary Criteria in the Indonesian Open Banking Ecosystem

Boundary Criterion	Description of Findings	Transcript Evidence
Legality & License	All bank informants (N2–N8) require active legal entity status, an operational license from BI/OJK, and a minimum of 1–2 years of operational history as preconditions.	N2: "legal entity has been running for more than one year... ownership, directors or CEO are also checked"
Reputation & Track Record	Banks assess prospective partners through historical checks (legal cases, media monitoring) and operational track record verification.	N4: "from the business side, from innovation, whether it aligns with bank expectations... from risk and governance"
Regulatory Compliance	Compliance with BI, OJK, and UU PDP regulations serves as a primary filter, including SNAP standard verification through ASPI.	N7: "referring to regulations from OJK or BI... there are derived regulations from the bank itself from risk management"
Technical Assessment	API integration capability, system reliability, infrastructure scalability, and SNAP standard compatibility are evaluated.	N6: "from assessment related to systems developed by partner companies... whether it can support and is reliable for integration"
Sharia Compliance	Specific to N5: collaborated products must receive Sharia Supervisory Board (DPS) approval, a governance layer absent from all comparison markets.	N5: "products must be sharia compliant by design... there is a sharia supervisory board that approves"
Ecosystem & Business Segment	Banks assess partner market segment alignment, considering synergy with corporate, SME, or retail segments.	N8: "divided into two, ecosystem because we are Astra Financial Group and also non-ecosystem"

Six broad categories of actors turn up in the data, each filling a different role across the ecosystem's several layers. Table 3 sets out that mapping as it came from the empirical work.

Table 3. Actor and Role Mapping in the Indonesian Open Banking Ecosystem

Actor	Role in Ecosystem
Bank Indonesia (BI)	Macro-Orchestrator, Facilitator, Boundary Keeper
OJK	Supervisor of financial entities and business plans
ASPI	SNAP Standard Verifier, Industry-Regulator Liaison (SRO) Meso-Actor layer
Banking Institutions	API Provider, Operational Orchestrator (Micro-Orchestrator), Intermediary
Fintech/PSP	Ecosystem Enabler, Merchant Aggregator, Distribution Channel
Merchants/End-Users	End-consumers of Open Banking services and value recipients

A multi-layer orchestration pattern emerges from the data. At the top, Bank Indonesia carries the macro-orchestrator role, pushing what it calls the 3I vision: Integration, Interoperability, Interconnectedness through BSPI and SNAP, a picture that matches the conceptual framework set out in Figure 1. In conclusion, banks function as micro-orchestrators, handling the practical work: partner selection, risk management, and deciding which use cases to pursue. ASPI sits somewhere in between, neither regulator nor operator but a Self-Regulatory Organization tasked with checking technical standards. N1 describes this function explicitly: ‘ASPI's role is not to represent one side but to verify standards and let the standards do the work of forcing alignment between banks and fintech.’ This intermediary function serves as the primary institutional mechanism managing the tension between banks, who tend to resist broad API openness to protect margin, and fintech firms, who seek wider data access to build competitive services.

Not every bank plays the micro-orchestrator role identically. N2 stays within corporate segments and holds firm on legality and compliance checks. N3 goes the other direction, chasing retail and consumer segments by riding the back of popular fintech apps. N4 treats trust as the central value proposition for SME and corporate work. N5 operates inside a halal ecosystem where Sharia-compliant products simply aren’t optional. N8, meanwhile, builds on the Astra Financial group's own internal ecosystem and handles internal versus external partners quite differently. This diversity confirms ecosystem governance is distributed across actor-specific logics rather than operating within a single hierarchy.

Five types of value flow surface across the interviews. Service and goods flow carry API services from banks through fintech to merchants SNAP APIs, QRIS, virtual accounts, payment gateways, and co-branded Sharia cards, among them. Monetary flows show up as revenue sharing between banks and fintech, merchant transaction fees, and the efficiency gains that come with both. Data flows move transaction information through API, SFTP, or consent management platforms working under UU PDP, cross-referenced with UU PDP Article 16's data minimisation principle in informant compliance accounts (N7). Information flows send regulatory guidelines, standards, and industry reports down from regulators to the rest of the industry. Underneath all four sits a fifth: intangible flows trust, reputation, Sharia compliance, customer experience.

Trust operates not merely as one value among several but as the precondition for all other value flows. N4 articulates this most directly: ‘We don’t sell products; we sell trust. When a fintech partner integrates with us, their customers see that a bank stands behind it. That changes everything about the risk perception.’ N1 (ASPI) reinforces how SNAP's governance architecture is designed to institutionalise this trust: ‘SNAP doesn’t only standardize the API; it standardizes three things: technical requirements, communication security, and governance. Governance is the most important because it determines who can be trusted to be in the ecosystem.’ This convergence of a macro-level regulator, a micro-orchestrator, and an SRO, all foregrounding trust as the primary ecosystem currency, constitutes empirical evidence for Adner’s (2017) proposition that intangible value alignment is the precondition for ecosystem viability. Notably, this trust asymmetry operates differently across actor segments: for N2 (BUKU 4), brand trust is pre-established and flows from bank to partner, while for N9 (Category 2 PSP), trust and legitimacy depend entirely on bank affiliation, creating a power asymmetry in intangible value access that smaller PSPs cannot easily overcome independently.

One value proposition breaks from the pack entirely: N10's regional payment gateway, which opens ASEAN markets to Indonesian merchants through a single API integration. N10 elaborates: 'We have a value proposition which is regional PG one API for multiple ASEAN countries.' This is the only documented case in the Indonesian Open Banking literature of a PSP empirically operating cross-border payment infrastructure across multiple ASEAN markets, grounding the ASEAN Regional Payment Gateway strategy directly in field evidence. Table 4 summarizes these value propositions across all four value-flow categories and actor types.

Table 4. Value Proposition of Actors in the Indonesian Open Banking Ecosystem

Core Value	Value for Banks	Value for Fintech/PSP	Reference
API Services Coverage	Access to broader customer ecosystems, new acquisition channels, and integrated payment services (VA, QRIS, transfer).	Merchants gain connectivity to all payment channels through a single API integration.	N2: "Business expansion to ecosystems not directly reachable is possible through open banking customers"
Trust & Reputation	Bank brand as a legitimate trust anchor for the digital ecosystem.	Fintech gains legitimacy and customer trust through bank affiliation — especially critical for smaller PSPs.	N4: "banks sell trust... with this collaboration, customers will see N4 has the capability"
Compliance & Risk Mgmt.	Legal certainty, data security standards, and structured risk governance.	Fintech obtains a standardized compliance framework, reducing operational risk.	N1: "SNAP regulates three aspects: technical, communication security, and governance"
Customer Experience	Seamless service, fast digital onboarding, and real-time transactions.	Merchants/users get an easier and more efficient transaction experience.	N3: "customer journey and security... people are already reluctant if there are 10 steps"
Revenue & Transaction Growth	Increased fee-based income, revenue sharing, and transaction volume from fintech ecosystem.	Fintech obtains compensation from services and merchant base growth.	N7: "Once with a partner, the first thing is revenue... profit we can get from this partnership"
Regional Payment Gateway	Cross-country ASEAN expansion through single API integration.	Merchants can access regional markets without re-integrating for each country.	N10: "We have a value proposition, which is regional PG... API for multiple ASEAN countries"

Six external forces act on the ecosystem, though unevenly. Regulation and technology pull hardest in the direction of growth, while cybersecurity pulls back against it as the main brake. Table 5 brings these together with the empirical findings sitting behind each one.

Table 5. External Driving Forces of the Indonesian Open Banking Ecosystem

External Factor	Key Findings
Regulation	SNAP, BSPI 2025/2030, and UU PDP No. 27/2022 function as dual-force drivers: accelerating standardization and interoperability while enforcing security and consumer protection compliance. Post-SNAP, competition shifted from infrastructure to service innovation.
Technology	REST/SNAP APIs, cloud computing, end-to-end encryption, tokenization, and Fraud Detection Systems (FDS) form the technical enabling foundation for Open Banking services.
Economy	Macroeconomic growth directly influences Open Banking transaction volumes. Digital payment transaction values are projected to grow over 600% from USD 100 billion (2018) to USD 704.46 billion (2030) (Bank Indonesia, 2024).
Social & Digital Literacy	Digital literacy remains context-limited; however, ease of use can drive adoption even without deep technical understanding. User experience design plays a critical role.
Consumer Education	Raising consumer awareness of Open Banking benefits requires coordinated collective efforts from banks, fintech, regulators, and industry associations.
Cybersecurity	Data breaches and cyber-attacks constitute the primary restraining force. Ecosystem responses include zero-trust principles, fraud detection systems, end-to-end encryption, penetration testing, and strict consent management.

The convergence of N3, N4, N7, and N9's accounts representing retail banking, corporate banking, SME banking, and fintech PSP segments respectively around cybersecurity as a primary concern points to a sector-wide anxiety that transcends individual actor risk posture and constitutes a structural inhibitor of ecosystem scale. N3 notes that fintech data breaches 'made customers ask us whether their data was safe with our partners,' while N9 reports that 'smaller PSPs are now being asked to pass security audits that weren't held to before SNAP, and not all of us have the resources.' This resource asymmetry, where SNAP simultaneously raises security standards (beneficial) and imposes compliance costs disproportionate to smaller actors' capacity (inhibiting), is a policy tension that the current SNAP framework does not resolve. Indonesia's archipelago of some 17,000 islands with uneven digital infrastructure (N9) compounds this by creating infrastructure-disparity-driven exclusion risk in underserved areas.

Combining the empirical findings with a TOWS analysis produces seven reconfiguration strategies, each complementing the others as a response for Indonesia's Open Banking ecosystem. Three of these strategies are grounded in Indonesia-specific empirical dynamics not present in global Open Banking discourse: the ASEAN Regional Payment Gateway strategy (drawing directly from N10's documented operational experience as the only PSP in this study already running cross-border payment infrastructure across multiple ASEAN countries); the Corporate Ecosystem Leverage strategy (grounded in N8's Astra Financial conglomerate model, which reflects Indonesia's distinctive ownership-concentrated financial sector); and the Halal Ecosystem dimension of the Win-Win Partnership Model (grounded in N5's DPS approval protocol, a governance layer absent from all comparative markets). Table 6 sets these out along with the reasoning behind them.

Table 6. Reconfiguration Strategies for the Indonesian Open Banking Ecosystem

Strategy	Description
SNAP Infrastructure Standardization	Accelerate universal SNAP adoption through Bank Indonesia regulatory mandate and ASPI verification programs to eliminate legacy API fragmentation. Indonesia-specific: mandatory SNAP (unlike Singapore's voluntary API Playbook) provides stronger standardization but requires ASPI-facilitated compliance pathways for smaller PSPs.
BI Data Hub Development	Build centralized data hub infrastructure based on SNAP standards enabling real-time policy analytics and visibility of ecosystem value flows by the macro-orchestrator — initially piloted with aggregated, anonymized transaction data for monetary policy analytics.
Win-Win Partnership Model	Develop transparent and equitable revenue-sharing models based on each actor's value proposition, ensuring fair compensation across the ecosystem hierarchy. Operationalised through a standardized API partnership tier framework: Tier 1 (SNAP-verified, full data access), Tier 2 (SNAP-compliant, limited data access), Tier 3 (SNAP-pending, sandbox access only).
Corporate Ecosystem Leverage	Banks leverage existing group ecosystems (e.g., Astra Financial, Halal ecosystem) to accelerate Open Banking adoption through internal network effects. Indonesia-specific: conglomerate-internal ecosystem orchestration reflects Indonesia's concentrated ownership structure with no comparable parallel in UK or Australian literature.
Seamless Service Innovation	Invest in frictionless onboarding processes, advanced security infrastructure (zero-trust architecture, FDS), and superior customer experience to drive adoption. Includes a SNAP Security Compliance Pooling mechanism enabling smaller PSPs to co-fund shared security audit infrastructure through ASPI.
ASEAN Regional Payment Gateway	Develop regional payment gateway infrastructure enabling Indonesian merchants to access ASEAN markets through a single API integration grounded in N10's empirical experience and aligned with BSPI 2030 cross-border interoperability objectives.
Shared Roadmap and Governance	Establish a quarterly Open Banking Coordination Forum co-chaired by ASPI with rotating bank and PSP representation, publishing annual regulatory guidance modelled on the UK's OBIE Steering Committee and designed to resolve the BI/OJK compliance overlap documented by N4 and N7.

DISCUSSION

The aims at going into this study was to trace how regulatory standardization and competitive pressure together structure, govern, and reconfigure Indonesia's Open Banking ecosystem. What comes out the other side is a coherent multi-layer orchestration structure, with its regulatory, operational, and value-flow dimensions lining up in ways that carry weight both empirically and against existing theory.

The multi-layered orchestration structure identified in this work and had substantial implications for how financial institutions govern financial data in an increasingly API-driven payment ecosystem, considering banking accounting information systems (AIS). The SNAP governance framework provides a standardized framework for managing financial data exchange between banks, ASPI, and fintech payment service providers, in terms of technical standards, communication security, and operational governance. These structures are especially critical for data integrity and for ensuring that the financial data utilized in accounting and reporting processes are correct, timely, and dependable (Diaha et al., 2026; Tiron-Tudor et al., 2022). In this instance, the banks operate as micro-orchestrators that go further than just orchestrating the relationships of their service partners. They also manage the underlying information flows that are employed in accounting and reporting procedures for documenting, reconciling, and integrating transactions. From an AIS point of view, ASPI also performs an equally significant function at the meso level. ASPI contributes to increased consistency and dependability across API integrations by encouraging and assessing compliance with established technical, communication security, and data governance standards. This limits the potential for discrepancies, unlawful access, or problems with data integrity when financial data is shared among the many participants of the ecosystem. This concern is consistent with evidence that digital competence and data literacy shape fraud-detection capability in Indonesian accounting contexts (Erfiansyah et al., 2026). Issues in the administration of API data could affect the quality and reliability of transaction records used in accounting and financial reporting. This is particularly critical for banks. In this sense, the orchestration structure identified in this research contributes not only to the coordination of an ecosystem but also to the control of financial data in its passage through a networked digital payment environment.

Bank Indonesia takes on the macro-orchestrator role, ASPI works as a meso-actor Self-Regulatory Organization, banks act as micro-orchestrators, and fintech firms serve as ecosystem enablers. This layered arrangement extends the Business Ecosystem Architecture framework set out by Ma et al. (2021) in a theoretically meaningful way, not merely as an application to a new context. The Indonesian case demonstrates that this binary is insufficient for nationally regulated, multi-authority ecosystems: a structurally distinct intermediate coordination layer responsible for technical standard verification without possessing either policy-setting or operational authority is empirically necessary for the framework to function. ASPI's meso-actor layer does not exist in any prior application of the Business Ecosystem Architecture framework and represents this study's primary theoretical contribution. Earlier studies on Indonesian Open Banking looked at the phenomenon through a regulatory lens (Billiam, 2022), a competitive one (Odorović, 2023), or an innovation-adoption one (Hasibuan et al., 2025; Noviaristanti et al., 2024; Shacheendran et al., 2025), but none applied an ecosystem architecture lens precise enough to locate an intermediary standard-setting actor between macro-level regulation and what happens on the ground.

The dispersal of orchestration across three institutional layers BI (macro), ASPI (meso), and banks (micro) is not an accident of history but a structural necessity imposed by Indonesia’s bifurcated regulatory architecture, in which BI and OJK hold non-overlapping legislative mandates established by separate legislation (Law No. 23/1999 on BI; Law No. 21/2011 on OJK). Drawing on Adner’s (2017) ecosystem-as-structure argument, a unified orchestrator like the UK’s OBIE would be institutionally impossible in Indonesia’s current regulatory architecture. The resulting distributed orchestration carries a double-edged theoretical implication: it produces coordination costs documented by N4 (‘sometimes we are asked the same thing by BI and OJK’) and N7 (‘our internal policy has to satisfy two sets of requirements’) that a centralised architecture would not, however simultaneously enables regulatory pluralism appropriate to Indonesia’s diverse financial sector. This distributed orchestration dynamic is

theoretically distinct from both the UK's OBIE-centric model and the firm-level orchestration modelled by Kamalaldin et al. (2021) and represents the study's primary theoretical contribution to ecosystem architecture literature.

The five value flow types found here service, monetary, data, information, and intangible flows build on the value interaction typology of Tricahyono and Purnamasari (2018) and echo what (Adner, 2017) describes as the logic of ecosystem value: competitive outcomes hinge on getting multiple value flows to line up at once, not on any one bilateral exchange. Trust looks to be the relational bedrock the other flows rest on, a reading consistent with digital trust research showing that institutional trust must exist before data-sharing behaviour would follow in platform-mediated financial services (Liao et al., 2022; Werth et al., 2020). The power asymmetry in trust flows, where BUKU 4 banks possess pre-established brand trust while Category 2 PSPs (N9) depend entirely on bank affiliation for legitimacy, extends Tricahyono and Purnamasari's (2018) value interaction typology by demonstrating that intangible value flows are not symmetrically distributed across ecosystem layers.

The flows of data and information are particularly important for Banking AIS because they are the means via which external transactions are transformed into accounting entries. The integrity of these flows depends on consistent data structures, comprehensive transmission, reliable system interfaces, effective reconciliation, and traceable audit trails. Therefore, system-level restrictions complement ecosystem trust to ensure that financial information remains trustworthy as it flows from external service providers into banks' AIS.

Indonesia's Open Banking ecosystem structure diverges from comparative reference cases in several analytically important ways. Unlike the UK's OBIE, which embedded both regulatory authority and operational standard-setting within a single entity under CMA mandate, Indonesia's distributed orchestration across BI, OJK, and ASPI creates compliance overlap documented by multiple informants. Unlike Singapore's voluntary API Playbook, SNAP's mandatory regulatory force achieves broader standardisation but suppresses service-innovation flexibility at the ecosystem periphery. It is the same for Australia's Consumer Data Right, which extends data portability across banking, energy, and telecommunications; Indonesia's SNAP-bounded Open Banking confines value flows to the payment system domain. These divergences are not failures of the Indonesian system but reflect different regulatory philosophies: mandatory versus voluntary, payment-focused versus economy-wide, distributed versus centralised that the Business Ecosystem Architecture framework alone cannot predict.

Regulation cuts both ways in this ecosystem, acting at once as an enabler and a constraint, which lines up with how digital economy theory (Gomber et al., 2018; Thakor, 2020) and cross-country fintech regulation studies (Babin & Smith, 2022; Zachariadis & Ozcan, 2017) have described regulatory standardization elsewhere: SNAP lowers integration costs and barriers to entry even as UU PDP raises compliance costs at the same time. Cybersecurity standing out as the dominant restraint fits with cybersecurity risk findings that rank Indonesia's data-breach exposure among the highest in the region (Thakor, 2020; World Bank, 2025).

The seven reconfiguration strategies map neatly onto the ecosystem collaboration typology of Kamalaldin et al. (2021). Bank Indonesia and ASPI act as Orchestrators, building an open digital architecture and coordinating collaboration; banks occupy a dual role as Orchestrators within their operations and Complementors at the sector level; and fintech firms lean almost entirely toward a Complementor strategy, staying close to bank ecosystem leaders consistent with platform-complementor behaviour documented in Indonesian fintech-banking partnerships (Muqorobin et al., 2021; Saputri & Fitri, 2025).

This paper contributes to the literature on Business Ecosystem Architecture that digital ecosystems at a national level led by regulators may require an explicit meso-actor layer to bridge macro-level policy and micro-level execution. Based on the present study, this layer assists in translating the regulatory and technical requirements into norms and practices that can be implemented by banks and fintech PSPs. From a banking accounting information systems (AIS) standpoint, the findings also suggest that banks need to design their internal information systems to interface effectively with SNAP-compliant APIs while maintaining the integrity of audit trails, accuracy of data

reconciliation, and compliance with regulatory reporting requirements. This expands the scope of AIS beyond transaction processing and connectivity toward the wider control of financial data as it traverses the multiple layers of the digital payment ecosystem. This means that SNAP compliance can be seen as not only a regulatory requirement, but also an essential component of AIS data governance as standardized API structures and security requirements lead to more consistent and traceable flows of financial data (Diaha et al., 2026; Tiron-Tudor et al., 2022). A complementary addition to the accounting information systems literature: the study expands the usual AIS boundary from intra-organizational information processing toward ecosystem-level financial data regulation. In this context, the quality of accounting information is affected not only by the internal controls of the AIS, but also by the governance and technological controls exercised on external API-based data exchanges. This gives an AIS perspective to comprehend how inter-organizational digital transactions can be turned into credible accounting and reporting information.

The results show that banking practitioners should regard SNAP compliance as part of AIS and API governance rather than simply a regulatory checklist. The overlap between BI and OJK compliance requirements revealed by N4 and N7 has implications for policymakers and ecosystem coordinators in terms of the need for more robust coordination mechanisms between regulators, banks, and PSPs. One potential approach is to hold a periodic Open Banking Coordination Forum, with representatives from banks, digital banks, PSPs, ASPI, and relevant regulators, with significant findings conveyed via appropriate regulatory or industry guidelines. N9's highlighted cybersecurity compliance challenges for fintech PSPs also underscore the resource limitations of smaller ecosystem players. One possible answer would be to think about shared security-compliance procedures through ASPI, such as pooled security assessment or audit infrastructure. This might decrease the individual compliance load while preserving common security requirements. Comparable types of collaborative infrastructure have been proposed in the broader literature on digital financial ecosystems and Open Banking (Sugarda & Wicaksono, 2023; Zachariadis & Ozcan, 2017).

CONCLUSION

What stands out most from this study is how multi-layer orchestration, value flow alignment, and regulatory standardization together shape the governance architecture of Indonesia's Open Banking ecosystem. Bank Indonesia operates as a macro-orchestrator; ASPI works as a meso-actor Self-Regulatory Organization verifying SNAP compliance, a structural layer not previously modelled in the Business Ecosystem Architecture framework; banks act as micro-orchestrators; and fintech firms serve as ecosystem enablers, all connected through five value flows in which trust constitutes the fundamental precondition rather than merely one value among several. Read through Business Ecosystem Architecture (Ma et al., 2021) and ecosystem collaboration theory (Kamalaldin et al., 2021), the findings point toward a reconfiguration strategy that needs to bring together regulatory standardization, trust-based partnership models, and cross-border ASEAN ambition and that must account for four Indonesia-specific dynamics (Sharia compliance layers, conglomerate ecosystem structures, mandatory SNAP standardization costs for smaller PSPs, and archipelagic infrastructure disparity) that are absent from all comparative reference markets.

The study's implications extend beyond theory, urging Bank Indonesia, ASPI, OJK, and participating financial institutions to embed the seven proposed reconfiguration strategies within structured national digital infrastructure planning. Three mechanism-specific governance proposals follow directly from the empirical evidence: a quarterly Open Banking Coordination Forum (addressing BI/OJK compliance overlap), a standardized API Partnership Tier Framework (reducing onboarding costs), and a SNAP Security Compliance Pooling mechanism (addressing cybersecurity resource asymmetry for smaller PSPs). Collectively, the evidence and strategies address the structural gaps between Indonesia's currently fragmented ecosystem and the more integrated national ecosystem models demonstrated by the United Kingdom, Australia, and Singapore.

This study comes with important boundary conditions. The case study design with ten informants, while sufficient to reach thematic saturation, cannot support statistical generalization to the full

population of Indonesian Open Banking actors. The absence of direct BI and OJK informants, mitigated through ASPI proxy triangulation and official document cross-referencing, as documented in the Method section, remains a limitation that future studies should address by engaging regulatory personnel directly. The observed ecosystem structure reflects Indonesia's specific regulatory and institutional environment at the time of data collection; caution is warranted when extending these findings to jurisdictions with different legislative architectures or to future phases of Indonesia's own BSPI 2030 implementation.

Even with those limits, this study matters because it applies Business Ecosystem Architecture to a national-scale, multi-regulator payment ecosystem for the first time, identifying a meso-actor layer that the original framework did not anticipate. The limitations noted above point toward productive future research directions: longitudinal designs tracking ecosystem evolution across the BSPI 2030 phase, mixed-method approaches combining the qualitative mapping developed here with quantitative surveys measuring adoption outcomes, and ASEAN comparative designs that would test whether the meso-actor orchestration model identified for Indonesia generalizes to comparable regulatory architectures in Thailand, Vietnam, or the Philippines. The contribution around AIS also points to a concrete future research direction. Future research can quantitatively explore the relationship between SNAP/API governance and results of AIS, including data accuracy, reconciliation efficacy, quality of financial reporting, auditability, and system reliability. Such work would provide an empirical test of the proposed transition from organization-centric AIS to ecosystem-oriented AIS. Future studies should look more closely at how efficient SNAP/API governance mechanisms affect operational accountability, data integrity, and the quality of financial information throughout interconnected digital banking ecosystems.

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