XRP's Challenge to SWIFT and Financial Innovation:

Strategic Analysis of a Distributed Ledger-Based Payment Infrastructure

Yoonsoo Kang[6]

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Abstract

This study examines the structural limitations of the SWIFT financial messaging system and explores how Ripple's XRP Ledger presents a strategic alternative for global financial innovation. Unlike SWIFT, which separates messaging and settlement layers, the XRP Ledger integrates them into a single network using the Ripple Protocol Consensus Algorithm (RPCA). Through its On-Demand Liquidity (ODL) mechanism, Ripple enables real-time cross-border transactions without the need for pre-funded accounts. The study applies the SER-M (Subject-Environment-Resource-Mechanism) and Weight-Sequence models to analyze Ripple's strategic architecture and execution. Key findings highlight XRP's technology-driven structural innovation, dynamic regulatory alignment, and strategic adaptability through network trust and decentralized governance. The results suggest that XRP offers a scalable and institutionally integrable infrastructure model, serving as a potential blueprint for the next generation of decentralized financial systems.

Keyword: XRP Ledger, Distributed Ledger Technology (DLT), SWIFT, On-Demand Liquidity (ODL), SER-M model

I. Introduction

[6] MBA Student (kangyoonsu89@gmail.com), Aalto MBA Class, aSSIST University, Seoul, Korea

1. Background and need for the study

In 1973, the world's leading financial institutions recognized the need for a unified messaging system for moving money between countries and founded the Society for Worldwide Interbank Financial Telecommunication (SWIFT). SWIFT has since become an internationally standardized network used by more than 11,000 financial institutions and has been the centerpiece of the global financial infrastructure for decades. However, SWIFT is a messaging system, not an actual movement of funds, and settlement of funds is done with delays through external networks such as Real-Time Gross Settlement (RTGS). This has led to systemic issues such as slow transaction speeds, high transfer fees, and low transparency.
This has led to various technological attempts to overcome the limitations of the existing centralized financial system, and the XRP Ledger, proposed by Ripple Labs, has gained attention as a leading decentralized international remittance infrastructure. Based on an energy-efficient consensus algorithm (RPCA), XRP Ledger allows globally distributed validators to confirm transactions within 3-5 seconds without the need for a centralized server, and transaction records are permanently stored in a form that can be viewed by anyone. In particular, the On-Demand Liquidity (ODL) mechanism introduced by Ripple enables real-time foreign exchange conversion and settlement without the need for the traditional Nostro/Vostro deposit structure, dramatically reducing the cost and speed of remittances.
These XRP-based mechanisms are more than just technological innovations, they are strategic in that they are attempting to structurally transform the financial system. Ripple's strategy directly challenges SWIFT's existing "information-driven, delayed payment structure" and seeks to reshape the global financial infrastructure through three pillars: technology (speed and cost), openness (decentralization), and scalability (ODL and partnerships).

2. Research objectives and questions

The purpose of this study is to structurally analyze how the XRP Ledger is strategically differentiated from existing international remittance systems, especially the SWIFT network, and how Ripple intends to realize financial innovation. To this end, this paper analyzes XRP's strategic structure according to the Subject- Environment-Resource-Mechanism (SER-M) model and applies the Weight-Sequence strategy framework to interpret the paths between XRP's execution priorities and outcomes.
The main questions of the study are as follows. First, it investigates how Ripple's proposed XRP-based remittance mechanism is structurally different from the existing SWIFT system. Second, it examines the ways in which XRP's technology, market strategy, and institutional environment influence financial innovation. Third, it explores how the SER-M and Weight-Sequence models can be used to explain the strategic success factors behind Ripple's approach.

3. Methodology and organization

This research centers on a qualitative case study analyzing Ripple's XRP strategy in comparison to SWIFT. To do so, we examine XRP's technical structure, market adoption, and institutional environment as independent elements, and how they ultimately affect the level of financial innovation (speed, fees, real-time, accessibility, etc.). We also identify

trustworthiness, legal clarity, and governance structure as parameters, and analyze the causal relationships between these elements to verify the systemicity of the strategy structure.
The research analysis follows a logical framework that consists of three key components. First, the SER-M model is used to structure Ripple's strategic elements into four categories: Subject, Environment, Resource, and Mechanism. Second, the Weight-Sequence model is applied to visualize the relative importance of each strategic factor and to determine the optimal order of execution in driving strategic prioritization. Third, a path analysis (also referred to as logical path mapping) is conducted to construct and interpret the influence pathways from independent elements, through parameters, to dependent outcomes.

4. Organization of papers

This thesis is organized into eight chapters. Chapter 2 reviews the theoretical background and existing literature on international remittance systems and blockchain-based payment infrastructure. Chapter 3 describes the analytical models used in this study (SER-M and Weight-Sequence model), and sets the research elements and proposition. Chapter 4 analyzes the strategy mechanism of XRP in the SER-M structure, and Chapter 5 presents a schematic of the XRP mechanism and a visual representation of the strategy execution sequence. Chapter 6 analyzes the strategic structure of SWIFT and XRP comparatively, and Chapter 7 draws strategic implications and policy recommendations. Finally, Chapter 8 summarizes the findings, discusses limitations, and provides directions for further research.

II. Theoretical background and case studies

1. International money transfer infrastructure and the structure of SWIFT

International remittances consist of a complex financial infrastructure that connects different currencies, financial systems, and legal regulations across borders. One system that has long been a key pillar of this remittance structure is SWIFT (Society for Worldwide Interbank Financial Telecommunication).
Since its founding in 1973, SWIFT has evolved into a global messaging network for the secure exchange of payment messages between banks. As of 2024, SWIFT is the world's largest financial messaging standards network, with more than 11,000 financial institutions in more than 200 countries, serving as the de facto standards infrastructure for international financial transactions.
However, SWIFT is essentially an "information transfer" system, and the transfer of funds itself is handled through individual banks' Nostro/Bostro account networks or RTGS (real-time gross settlement systems), not SWIFT. This results in multiple layers of intermediary bank involvement, and differences in exchange rates and regulations often mean that the final settlement can take several days. Transaction fees also accumulate based on the number of banks involved, with the overall cost often exceeding tens of dollars.
This structural characteristic results in several notable limitations. First, the system causes delayed settlement, as there is no real-time processing; transactions typically require one to three business days to be completed. Second, it involves a high cost structure due to the accumulation of various fees, including charges from intermediary

banks and currency conversion costs. Third, the system suffers from a lack of transparency, as information related to transaction routes and processing status is often withheld or inaccessible. So while SWIFT has the advantages of reliability and universality, it is inherently limited in the "speed, efficiency, and real-time" that the digital age demands.

2. Distributed Ledger Technology (DLT) and XRP Ledger Overview

Distributed ledger technology (DLT) is a technology that enables transaction information to be collaboratively verified and stored by network participants without a central authority, and includes various forms of decentralized data structures, including blockchains.
The XRP Ledger is a DLT-based international remittance infrastructure developed by Ripple Labs that, unlike Bitcoin, uses the Ripple Protocol Consensus Algorithm (RPCA) rather than Proof of Work (PoW) as its key differentiator. The consensus algorithm is designed so that a transaction is recorded on the ledger when more than 80% of a small group of trusted validators approve it, a process that takes an average of 3-5 seconds.
The main features of the XRP Ledger include the following. First, it offers exceptional speed, with transaction confirmations occurring within seconds—hundreds of times faster than traditional SWIFT systems. Second, it ensures low transaction costs, averaging around $0.0002 or less. Third, it provides transparency, as all transactions are recorded on a public distributed ledger for real-time traceability. Fourth, it maintains decentralization through a validator network operated by a variety of organizations outside of Ripple Labs.
Ripple has also built an On-Demand Liquidity (ODL) feature on top of the XRP Ledger. ODL allows senders to convert their local currency to XRP, and recipients to settle by converting XRP back to their local currency, enabling real-time cross-border liquidity without the need for intermediaries.
These XRP-based systems are not just blockchains, but infrastructure alternatives that can solve bottlenecks in the existing financial network.

3. Financial innovation and institutional change

In the 21st century, advances in digital technology have required fundamental changes to the financial system. New services such as mobile banking, open banking, and digital currencies have emerged, raising expectations for speed, cost, and accessibility by leaps and bounds. In turn, international payment systems need to be faster, cheaper, and more transparent.
The international community has also recognized this need. The G20 has set improving cross-border payments as a global agenda for 2020 and beyond, and the Bank for International Settlements (BIS), IMF, World Bank, and others are expanding research into alternative payment systems utilizing blockchain and DLT technologies.
In addition, as Central Bank Digital Currency (CBDC) projects are actively developing around the world, the potential for DLT-based payment infrastructure to be linked to institutional monetary systems is growing. Ripple is proactively responding to these developments and has partnered with central banks and banks in France, the United Arab Emirates (UAE), Brazil, the Philippines, and more.
This suggests that financial innovation is not just about technology, but also about the institutional environment, policy flexibility, and acceptance of global governance.

4. Limitations of existing research

Previous studies on international remittance systems have primarily focused on SWIFT's standardized messaging structure and its impact on global financial stability. In contrast, academic analysis of emerging DLT-based systems remains in its infancy, and strategic-level research on Ripple and the XRP Ledger as institutional challengers is notably scarce.
Most blockchain-related literature has emphasized either technical principles or legal classifications, lacking a structured interpretation through the lens of strategic theory. To bridge this gap, the present study employs the SER-M (Subject–Environment–Resource–Mechanism) model and the Weight-Sequence strategic framework to theoretically structure the strategy of XRP.
The SER-M model offers a versatile analytical framework to capture how key elements—technological subjectivity (S), institutional environment (E), and strategic resources (R)—interact through the mechanism (M) to produce outcomes. It is especially suitable for integrating concepts from Resource-Based View (RBV), Neo-Institutional Theory, and Technology Acceptance Models (TAM).
Furthermore, the Weight-Sequence framework enables dynamic analysis of strategic execution by visualizing the relative importance (Weight) and executional order (Sequence) of each strategic component. This approach provides an effective means to explain Ripple's gradual market entry strategy and long-term infrastructure positioning.

III. Study Design and Analytical Models

1. Study objectives and scope

The SWIFT system, the global payments infrastructure par excellence, and Ripple's XRP-based international remittance infrastructure, which is challenging it, were selected as comparative cases for this study. Ripple's approach is inherently different from traditional financial infrastructure in terms of technology (distributed ledger), strategy (ODL), market adoption (partnerships), and institutional responses (regulation and CBDC alignment), demonstrating the potential for structural transformation of financial innovation.
Therefore, this study aims to analyze the strategic structure of XRP and systematically examine how it affects the extent to which financial innovation is realized. The case of Ripple's XRP encompasses not only technical achievements but also complex phenomena such as institutional conflicts (e.g., SEC lawsuits), partnership expansion (e.g., SBI Remit, Tranglo), and policy acceptance (e.g., ISO 20022 inclusion), which provides depth and breadth to the analysis.
This study aims to compare and analyze the strategic architecture of Ripple's XRP-based distributed ledger system and the SWIFT system, which has long served as the global standard for international financial messaging. To ensure analytical clarity and relevance, the following three comparative criteria have been established.

First, Integration of Information and Value. SWIFT operates as a message-only system, transmitting payment instructions while actual fund settlements are executed separately through RTGS systems or intermediary banks. XRP, by contrast, processes both information and value transfer within a unified, real-time network, creating a fundamentally different transaction infrastructure.
Second, Network Trust Structure. SWIFT relies on centralized governance and trust in

intermediary financial institutions. XRP Ledger, however, operates via a decentralized validator network based on a consensus mechanism (RPCA), providing structural advantages in terms of security, auditability, and resilience.
Third, Transaction Efficiency and Accessibility. Transactions on SWIFT take one to three business days and incur high fees due to the involvement of correspondent banks. In contrast, XRP transactions settle in 3–5 seconds with fees of less than a few cents, offering a significant advantage in cross-border micropayments and remittances in underbanked regions.
These criteria serve as the analytical foundation for the SER-M and Weight-Sequence models presented in the following sections. They justify the element selection and proposition development and illustrate how Ripple's approach offers a strategic alternative to traditional financial infrastructure.

2. SER-M model overview and how it works

Ripple's strategy can be understood as a complex strategic structure that emerges from the interplay of its technological structure, institutional environment, and market strategy. To structure it, this study uses the SER-M model as an analytical model. SER-M model configuration is as follow.

- S (Subject): The entity that designs and executes the strategy (Ripple Labs, XRP community, etc.)
- E (Environment): Technical, market, and institutional external environment (financial regulation, CBDCs, policy receptivity, etc.)
- R (Resource): Key resources to execute the strategy (XRP Ledger, ODL, partnerships, etc.)
- M (Mechanism): The execution mechanism that S, E, and R interact to form.

This analytical model allows us to systematically explain how XRP is structurally different from SWIFT in its strategy.

3. Weight-Sequence Strategy Frame

Beyond simply correlating elements, we can structure Ripple's strategy design logic by visualizing the weight and priority sequence of strategy execution elements. The Weight-Sequence framework is organized as follows: first, the "importance" (or weight) refers to the relative impact of each strategic element on achieving financial innovation; second, the "sequence" indicates the order in which these strategic steps should be applied on the execution roadmap.
Ripple's strategy is organized in the following order: technology structure → ODL strategy → regulatory response, with the largest weight allocated to the technology-based structure (XRP Ledger). This model confirms that XRP's strategic logic is not based on short-term profit maximization, but on long-term infrastructure-driven innovation.

4. Element definitions and structure

① Independent elements (S, E, R)

<Table 1> Independent elements

Elements	Description.	SER classification
Technical structure	DLT structure based on XRP Ledger, RPCA consensus algorithm	Subject
Drafting Environment	Regulatory levels, policy receptivity, and CBDC trends	Environment
Market strategy	On-Demand Liquidity (ODL), Global Partnerships	Resource

② Parameters (Mechanism)

<Table 2> Parameters

Elements	Description.	Feature types
Network reliability	Select a validator node that users can trust	Selective
Legal clarity	Strategy adjusts as regulatory environment changes	Adaptive
Governance structure	Evolving strategy through feedback between Ripple and the community	Learning

③ Dependent Element (Performance)

The degree of financial innovation can be assessed using several key metrics. First, send speed is a critical factor, typically measured by comparing transactions completed in seconds versus those taking several business days. Second, fee levels are evaluated based on the cost per transaction, such as a few cents versus tens of dollars. Third, real-time capability refers to the speed of trade confirmation and settlement. Fourth, accessibility considers whether users can participate without constraints related to time or geographic location.

5. Research Proposition

<Table 3> Research Proposition

Number	Proposition content	Element Structure
P1	XRP's technical structure (Subject) has a positive impact on performance, mediated by network trust (Selective).	S → M (select) → Performance
P2	XRP's market strategy (Resource) positively impacts performance through legal clarity (Adaptive).	R → M (Adjustments) → Performance
P3	Institutional environment (Environment) positively affects performance through the governance structure (Learning).	E → M (Learning) → Performance
P4	Technical structure (Subject) has a positive impact on performance (speed, fee reduction, accessibility) directly and without mediation.	S → Performance
P5	Greater legal clarity maximizes the effectiveness of market strategies and contributes to financial performance.	R × M (Adaptive) → Performance
P6	Ripple's governance structure has a moderating	E × M (Learning) →

	effect on strategy effectiveness through its interaction with the institutional environment.	Performance

IV. Strategic Path Analysis: XRP's SER-M Structure and Performance Mechanisms

Based on the SER-M analytical model, this chapter analyzes how Ripple's XRP-based international remittance infrastructure realizes financial innovation from the perspective of structural pathways and proposition testing. In particular, it logically explains the structure through which Performance is derived through the connection between independent elements (S/E/R) and parameters (Mechanism), and summarizes the importance and implementation priority of each strategy element in terms of Weight-Sequence.

1. Configuring an analytics model: SER → Mechanism → Performance

XRP's strategy is based on inputs consisting of technology-based structure (Subject), institutional environment (Environment), and market strategy (Resource), and outputs (Performance: speed, fees, accessibility, etc.) through the strategic mechanisms of trust, legal clarity, and governance structure. Each path corresponds to the following.

<Table 4> Configuring an analytics model

Independent Elements (S/E/R)	Parameter (M)	Dependent Element (Performance)
Technical Structure (XRP Ledger)	Network reliability (optional)	Send money faster, reduce fees, and increase reliability
Market strategy (ODL, etc.)	Legal clarity (coordination)	Increase regulatory acceptance, make your strategy more actionable
Institutional environments (CBDCs, etc.)	Governance structure (learning- based)	Make policies more responsive, systems more adaptable

2. Path analysis based on core proposition

Proposition 1 (P1): Subject → Network Reliability → Performance:

- The technical structure of the XRP Ledger realizes high network reliability through the RPCA consensus algorithm and globally distributed validator structure. Users have the confidence to participate in the system by selecting trusted nodes themselves, which ensures the speed, security, and decentralization of transactions in the XRP system. → This trust positively impacts real-world participation and user diffusion in the Ripple ecosystem, serving as the foundational infrastructure that enables financial innovation.

Proposition 2 (P2): Resource → Legal Clarity → Performance:

- While ODL strategies and global partnerships contribute to the proliferation of financial infrastructure, ambiguity in regulatory interpretation impacts their viability. The adoption rate and credibility of ODL strategies could be further enhanced if the legal status of XRP in particular is clarified. → Ripple is working on ISO 20022 alignment and engagement with key national regulators to increase

this
- legal alignment, which will lead to greater policy acceptance of the ODL strategy.

Proposition 3 (P3): Environment → Governance Structure → Performance:
- In response to the changing regulatory landscape, Ripple is increasingly moving away from a Ripple Labs- centric structure and toward community-driven decentralized governance. → Example: Key Validators spread to organizations outside of Ripple (SBI, University of Nicosia, etc.)

This governance evolution simultaneously increases regulatory response flexibility and strategy sustainability and provides a foundation for learning and adapting strategies to changing policy environments.

3. Complementary proposition: direct and interaction effects

Proposition 4 (P4): Direct effect of technical structure
- The technical structure of the XRP Ledger can directly impact financial performance without any intermediation. → Average transaction speed (3-5 seconds), fees (as low as $0.0002), and network availability are unique technical performance indicators of the XRP system.

Proposition 5 (P5): Legal clarity enhances strategy effectiveness
- ODL strategies are more effective in terms of financial institution adoption, partnership scalability, and speed to market when legal clarity is achieved. → Example: Increase in XRP adoption by countries and companies after the 2023 U.S. ruling

Proposition 6 (P6): Governance structure enhances strategy adaptability:
- Ripple's decentralized operating system provides the learning capability to flexibly modify or adapt its strategy in the face of rapidly changing regulatory environments. This is key to transforming short-term regulatory risk into a long-term survival strategy.

4. Strategy Prioritization Analysis (with Weight-Sequence)

<Table 5> Strategy Prioritization Analysis

Strategy elements	Importance (Weight)	Execution order (Sequence)	Description.
Technical Structure (S)	★★★★★	1st	The XRP Ledger is the underlying technology behind the entire strategy and is the centerpiece of Ripple's strategy.
Market Strategy (R)	★★★★☆	2nd	ODL strategies are execution logic built on top of technology to trigger actual trades.
Drafting Environment (E)	★★★☆☆	3rd	Policy acceptance determines strategy scalability and institutionalization

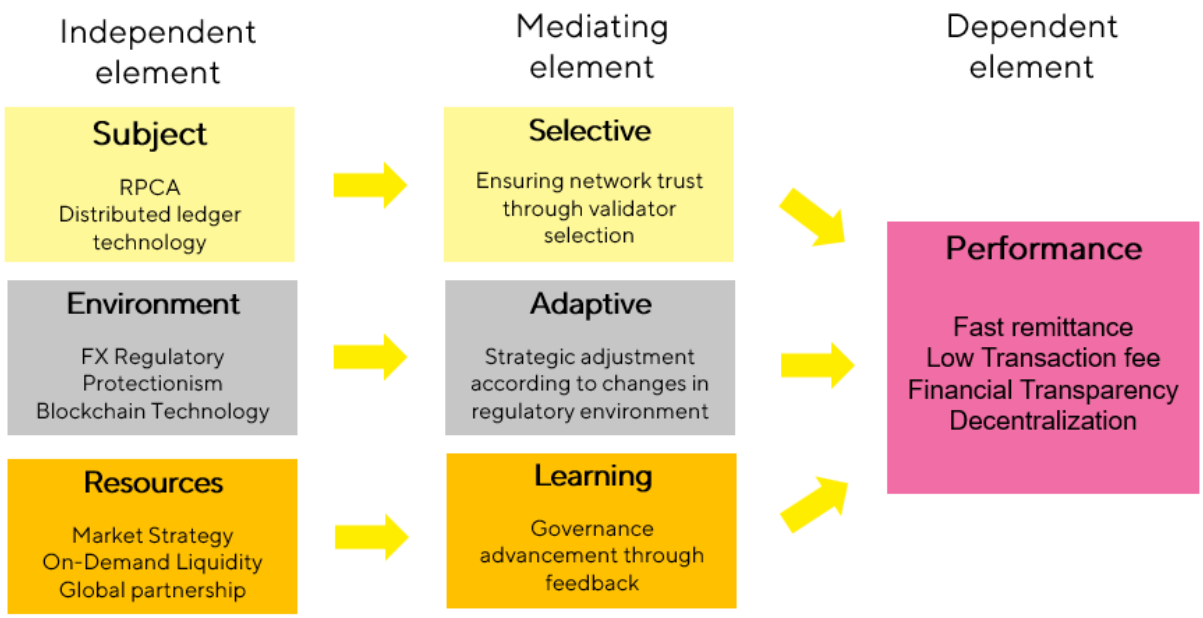
The XRP strategy consists of a technology foundation, market expansion, and strategic alignment and integration of the institutional environment, which falls under the Agile Lion strategy type. Ripple's strategy is not just a set of feature enhancements, but a structural strategy that organically connects the three layers of technology, market, and institutions to design a path to results. Specifically, each element of the strategy is structural in the sense that it is mediated through mechanisms to enable new standards in financial infrastructure (speed, cost, trust, transparency).

V. Visual structural analysis and modeling

1. Schematic representation of the mechanics of XRP

This study integrates and summarizes Ripple's strategy structure based on the SER-M (Subject-Environment- Resource-Mechanism) model and parametric analysis model, and derives a strategy path model to visualize it. The figure below is a visual representation of the causal mechanism and outcome structure of XRP's strategy.

〈Fig.1〉 Schematic representation of the mechanics of XRP



The model has three key independent elements (SER factors) that lead to financial innovation performance through different mechanism pathways. Each pathway is functionally aligned with the strategic structure designed by Ripple.

① Subject → Selective Mechanism → Performance

As the technical entity, Ripple Labs has built a high-performance distributed ledger around the XRP Ledger and the RPCA consensus algorithm. This technical architecture allows users to autonomously select validators, ensuring the decentralization and reliability of the network. This selective structure enhances both security and transparency, resulting in faster remittance processing and transaction reliability.

② Environment → Adaptive Mechanism → Performance

Ripple's strategy is not just about implementing technology, but also about being flexible enough to respond to changing regulatory environments and policies in different countries. For example, unlike the U.S., where the legal status of XRP is unclear, Japan and other countries in Southeast Asia have embraced RippleNet. By adapting its strategy to changing environments, Ripple increases the likelihood of institutional acceptance and policy integration, and strengthens its policy-based credibility and institutional linkages.

③ Resources → Learning Mechanism → Performance

Ripple is more than just a technology company, with global partnerships (SBI, Tranglo, Santander, etc.) and an ODL strategy that is being applied to real-world financial transactions. This market strategy is embedded with a learning structure that iterates and refines the strategy based on feedback from customers, which evolves Ripple's governance structure. This enables Ripple to continuously adapt its strategy, while enhancing market scalability and service continuity.

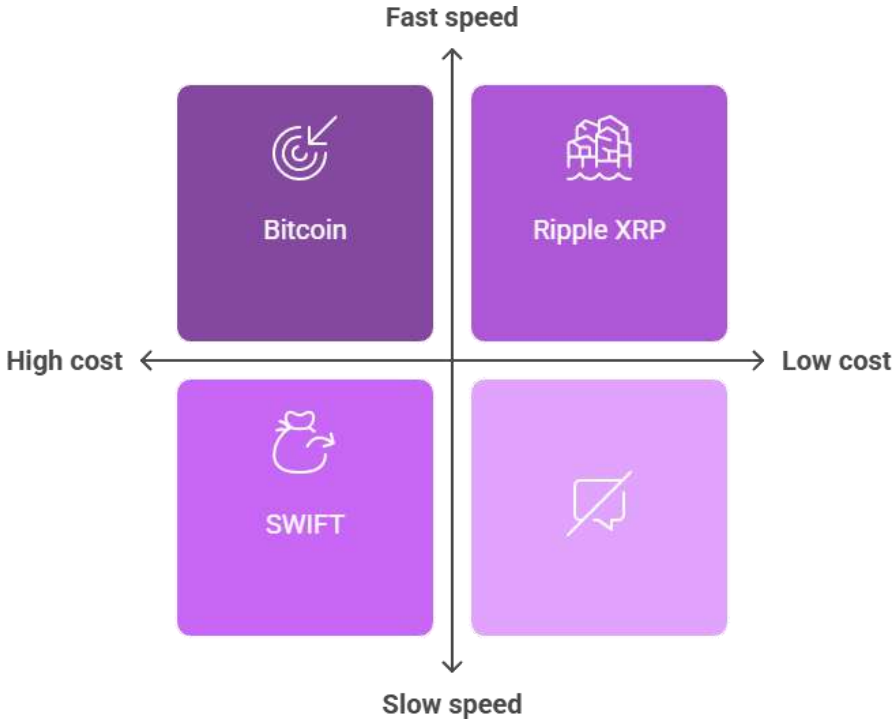
④ Performance

The collective action of these three pathways demonstrates that the XRP-based infrastructure designed by Ripple can outperform the legacy SWIFT system. This performance is comprised of four elements: first, fast money transfers, with payment confirmations occurring within 3 to 5 seconds; second, low fees, averaging around $0.0002 per transaction; third, financial transparency, enabled by the traceability of all transactions via a public ledger; and fourth, a decentralized structure, achieved through a network of validators that distribute authority across multiple independent entities.
The model explains that the XRP strategy is more than a simple application of blockchain technology, but a structured strategic mechanism designed in three areas: technology, environment, and market, which can be evaluated as a practical example of financial system transformation.

2. Analyzing strategy prioritization based on the Weight-Sequence model

Ripple's XRP strategy clearly shows the structural differences between the traditional financial system and the existing cryptocurrency model. To illustrate this, this study categorizes the major remittance methods in the market into strategy types based on the Weight-Sequence strategy model. This model categorizes a company or system's strategy into four types based on the weight of strategic thinking and the presence or absence of a logical sequence of execution.
First, the traditional bank remittance system suffers from structural limitations such as high cost structure, reliance on intermediaries, and slow speed, yet it has seen little strategic innovation or structural improvement. These approaches are resource intensive, lacking strategic direction and sequential execution, and are characterized as white elephants. This is a classic example of a high-maintenance organization that fails to deliver real innovation in the marketplace.
Bitcoin, on the other hand, has the technological heft of decentralization and security, which has positioned it firmly as the foundation currency of the digital asset ecosystem. However, it lacks an organized scaling roadmap in terms of execution sequence or market penetration. As a result, Bitcoin is categorized as a Prudent Cow, or Cash Cow, which retains its unique technical weight but lacks sequentiality in its expansion strategy.

<Fig.2>. Analyzing strategy prioritization based on the Weight-Sequence model.



In comparison, XRP can be defined as an agile lion. XRP has not only realized fast processing speeds and low costs based on the XRP Ledger technology and the RPCA consensus algorithm, but it is also executing a systematic and phased expansion strategy in the remittance market through its On-Demand Liquidity (ODL) strategy. In other words, XRP is a model that has built a roadmap with technical weight and a strategic sequence of implementation, including regulatory responses, market partnerships, and expansion to emerging countries. This demonstrates a clear strategic advantage and differentiation from existing systems.
In conclusion, XRP is not just a technically superior cryptocurrency, but an integrated innovative system with strategic design and execution that is positioned to lead the reshaping of the global remittance infrastructure.

3. Step-by-step execution logic of the XRP innovation mechanism

Ripple's strategy follows a path of technology → execution → institutional adoption, with each step organized into the following structure.

<Table 6> Step-by-step execution logic

Steps	Contents	Strategy keywords	What to expect
Step 1	Build your technical infrastructure	XRP Ledger, RPCA	Get lightning-fast transactions, low costs, and decentralized consensus
Step 2	Apply an execution strategy	ODL, Global Partnerships	Get real, get liquid
Step 3	Strengthen institutional acceptance and credibility	ISO 20022, CBDC cooperation, Responding to the SEC	Going institutional, expanding financial institution adoption

This phased structure demonstrates that Ripple's strategy is not simply a "build the technology and wait for the market" approach, but rather a long-term structure that strategically designs execution and institutional integration on top of the technology foundation. The XRP strategy has been executed in three phases: technology → market → institutions, with each phase leading to performance through network reliability, legal clarity, and governance structures. Ripple has designed the weight and sequence of its strategy execution to be logical, aligning with its focus on building a sustainable global infrastructure rather than short-term profits. This strategic configuration is worth analyzing as an empirical example of the future of a decentralized network- based financial system.

VI. Strategy Comparison Analysis: XRP vs SWIFT

Ripple's XRP-based international remittance infrastructure has an inherently different strategic structure than SWIFT, the existing global payments standard. This chapter compares and analyzes the strategic competition between the two systems, focusing on the structural differences between them, the conflict between their technology and network-centric strategies, and their approach to regulation.

1. Compare structural differences

Ripple and SWIFT have structural differences not only in the way they handle remittance information, but also in the flow of funds, settlement methods, and network structure.

<Table 7> Compare structural differences.

Separation	SWIFT	Ripple (XRP)
Feature structure	Message delivery only network (funds transfer is done separately via external networks such as RTGS)	A unified ledger-based system where information and funds move simultaneously
Payment speed	1-3 business days (element based on number of intermediary banks)	Confirm trades in 3-5 seconds
Liquidity structure	Nostro/Vostro account-based prepayment system	ODL-based real-time currency exchange, no deposit required
Who operates the system	SWIFT Association-centric closed engagement model	Decentralized network led by Ripple Labs + decentralized validators
Transaction tracking and transparency	No real-time tracking of transaction status, opaque intermediary steps	Every transaction is recorded on the blockchain and available for anyone to view
Standardization and integration strategy	ISO 20022 ready, but still closed system- centric	Full ISO 20022 integration + easy integration with external systems based on open APIs

2. Network effects vs. technological innovation

The competitiveness of international remittance infrastructure is not solely determined by

technological capabilities, but also by network effects—specifically, the number of financial institutions and customers connected to the system. SWIFT's strength lies in its global network effect: it has over 11,000 financial institutions already on board, benefits from longstanding bank-to-bank trust and proven stability, operates through a multinational governance model centered on member states, and is supported by standardized protocols and well-established legal acceptability. In contrast, Ripple's strengths are rooted in technical innovation. It offers real-time payment capabilities and a decentralized structure based on a distributed ledger, ensures energy efficiency and security through the RPCA consensus algorithm, utilizes On-Demand Liquidity (ODL) strategies to optimize forex liquidity, and achieves rapid market penetration through direct partnerships with financial institutions.
Ripple is building a technology innovation-driven diffusion structure with a specific partner-centric diffusion model (fintechs, emerging market financial institutions) rather than engaging traditional financial institutions. This is more of a diversionary substitution strategy rather than a traditional incremental adoption model. As a result, SWIFT is a network-based inertial dominant and Ripple is a technology-based challenger, creating a complementary competitive structure, with Ripple executing a strategy of "pushing SWIFT beyond its functional limits with technology."

3. Regulatory response and institutional acceptance strategies

Financial infrastructure systems depend more on institutional trust and regulatory acceptance than on technology alone, and in this regard, Ripple and SWIFT differ significantly in how they are integrated into the global financial system. SWIFT operates with formal approval from financial institutions and national central banks, maintains a clear legal position and accountability framework, and actively participates in international standards bodies such as ISO, BIS, and the IMF. In contrast, Ripple's institutional strategy has evolved under more complex circumstances. Legal disputes with the SEC and other regulators initially created uncertainty around XRP's legal status, but court rulings in 2023 and 2024 partially recognized XRP as a non-security. In response, Ripple has revised its strategy to enhance compatibility with existing institutional networks through initiatives such as ISO 20022 compliance and alignment with central bank digital currency (CBDC) systems. Additionally, it has pursued localization strategies tailored to country-specific regulatory environments, as seen in its integration into formal financial networks in Japan, the UAE, Brazil, and other jurisdictions.
Ripple is adopting a hybrid strategy of institutional acceptance and partnerships to establish itself as a real-world financial infrastructure, while building on decentralized technology.

VII. Strategic implications and policy recommendations

The XRP-based payment infrastructure is not just a technological alternative, but reflects a strategic design to fundamentally reshape the workings of the global financial system. In this chapter, we analyze the future scalability and institutional acceptance of Ripple's strategy and propose a strategy for Korean financial and IT companies to respond to the potential reshaping of the global payment infrastructure.

1. Scalability and Institutional Acceptance of XRP

In addition to technical performance, XRP's scalability is also driven by legal clarity and policy acceptance. On the technical side, XRP has a competitive advantage based on its low transaction fees, fast processing speeds, and decentralized validator structure. In fact, global financial institutions such as SBI Remit (Japan), Tranglo (Southeast Asia), and Santander (Spain) have adopted XRP-based remittance systems, and Ripple's On-Demand Liquidity strategy is proving commercially viable.
On the other hand, three conditions must be met for XRP to gain institutional acceptance. First, the legal status of XRP must be clearly defined in major countries. While a US court ruling in 2023 has partially resolved the securitization debate, legal uncertainty still exists. Second, it is essential to respond to international norms such as ISO 20022, FATF regulations, and KYC/AML requirements. Third, it is necessary to gradually move away from a Ripple Labs-centric operational structure and establish a decentralized governance system. When these conditions are met, XRP will be able to translate its technical capabilities into institutional diffusion.

2. The potential for future multipolarization of the global payments infrastructure

The existing global payments infrastructure is based on a centralized order centered on SWIFT, but in recent years, a confluence of technological and institutional trends has raised the possibility of multipolarization. First, the existing SWIFT system is based on stability and international trust, but it has limitations in terms of processing speed and cost. Second, blockchain-based infrastructures, including XRP, are innovative in terms of real-time, cost-effectiveness, and transparency, and are becoming increasingly commercialized. Third, central bank-led digital currencies (CBDCs) are accelerating the deployment of country-led payment infrastructure.
These three pillars are likely to be reorganized into functional complementarities rather than mutual substitutions. For example, large value settlements could remain within the SWIFT system, while decentralized infrastructure such as XRP could be utilized in certain areas, such as micro-transfers and remittances to overseas workers. The XRP Ledger also has the flexibility to work in conjunction with CBDC issuers, allowing it to expand as a neutral infrastructure.

3. Response strategies for Korean financial and IT companies

Despite having a sophisticated digital infrastructure and a fintech industry with high growth potential, South Korea has been relatively slow to proactively respond to changes in global payment infrastructure. Therefore, the following strategic responses are required. First, in the short term, there is a need to expand empirical experiments on XRP-based remittance systems through collaboration between domestic financial institutions and blockchain companies. An example is the domestic remittance pilot project that tests the integration with RippleNet. Second, in the medium to long term, the technical and policy foundation for interoperability between the Bank of Korea's CBDC project and external DLT infrastructures should be established. This will pave the way for the Korean digital currency system to be connected to global payment networks.
Third, on the regulatory side, it is necessary to overhaul the system related to the legal definition of digital assets, utilization of stablecoins, and regulation of cross-border remittances. This requires expanding the regulatory sandbox and strengthening collaboration with the Financial Services Commission and the Ministry of Science and ICT. Fourth, Korean financial institutions and IT companies should secure opportunities to

become part of the international payment infrastructure through strategic alliances with various global infrastructures such as RippleNet, Stellar, and Ethereum.
In summary, rather than relying solely on the existing SWIFT system, South Korea should actively engage in blockchain-based global flows and institutional experiments to create a foundation for itself to become a strategic hub for digital finance.

VIII. Conclusions and implications

1. Proposition verification

- P1: Subject → Network Reliability → Performance → Result: True
The technical structure of the XRP Ledger realizes high network reliability through the RPCA consensus algorithm and a globally distributed validator structure. Users can select trusted nodes themselves, lowering the psychological barrier to participation. This ensures speed, security, and decentralization in XRP transactions.
→ This trust positively impacts real-world participation and user diffusion in the Ripple ecosystem, serving as the foundational infrastructure that enables financial innovation.

- P2: Resource → Legal Clarity → Performance → Result: True
While ODL strategies and global partnerships contribute to the proliferation of financial infrastructure, ambiguity in regulatory interpretation impacts their viability. The adoption rate and credibility of ODL strategies could be further enhanced if the legal status of XRP is clarified.
→ Ripple is working on ISO 20022 alignment and engagement with key national regulators to increase legal alignment, which will lead to greater policy acceptance of the ODL strategy.

- P3: Environment → Governance Structure → Performance → Result: True
In response to the changing regulatory landscape, Ripple is increasingly moving away from a Ripple Labs-centric structure and toward community-driven decentralized governance.
→ Example: Key Validators include organizations outside of Ripple (e.g., SBI, University of Nicosia)
This governance evolution simultaneously increases regulatory response flexibility and strategy sustainability, and provides a foundation for learning and adapting strategies to changing policy environments.

- P4: Direct effect of technical structure → Result: True
The technical structure of the XRP Ledger can directly impact financial performance without any intermediation.
→ Average transaction speed (3–5 seconds), fees (as low as $0.0002), and high network availability are unique technical performance indicators of the XRP system.

- P5: Legal clarity enhances strategy effectiveness → Result: True
ODL strategies are more effective in terms of financial institution adoption, partnership scalability, and speed to market when legal clarity is achieved.
→ Example: Increase in XRP adoption by countries and companies after the 2023 U.S. ruling

-P6: Governance structure enhances strategy adaptability → Result: True
Ripple's decentralized operating system provides the learning capability to flexibly modify or adapt its strategy in the face of rapidly changing regulatory environments. This is key to transforming short-term regulatory risk into a long-term survival strategy.

2. Research summaries and contributions

This study analyzes how the XRP Ledger-based international remittance system overcomes the structural limitations of the existing SWIFT system and how Ripple is designing its strategic structure in terms of technology, market, and institutions. To this end, we summarized the structural components, mechanisms, and implementation priorities of the XRP strategy based on the Subject-Environment-Resource-Mechanism (SER- M) model and the Weight-Sequence framework.

XRP's strategy is not just a crypto asset, but an attempt to build a unified distributed ledger-based payment infrastructure that enables the simultaneous movement of information and value, and is expanding into real- world commercialization through its On-Demand Liquidity (ODL) strategy and global partnerships. This study finds that the XRP strategy is not the work of a single entity, Ripple Labs, but rather a dynamically evolving structure that is driven by decentralized governance and a changing global regulatory environment.

By comparing the SWIFT and XRP systems, this study provides a concrete visualization of the differences between the limitations of the existing financial infrastructure and the alternative structure proposed by XRP, and suggests that the future of payments infrastructure will likely be a hybrid, multi-polar structure rather than a single standard.

The academic and practical contribution of this analysis is that it seeks to interpret XRP as a case of strategic infrastructure design, rather than a technology-centric discussion or a binary debate about its legal status.

3. Limitations and future research directions

This study focuses on qualitative analysis of the structure and implementation of the XRP strategy, and constructs a theoretical model based on Ripple's official reports, the usage of case companies, and primary literature. However, the following limitations exist

First, Ripple's strategy is closely related to the rapidly changing global regulatory environment, and this study focuses on some of the rulings following the US SEC lawsuit. Future developments in legal precedent may change the level of institutionalization of XRP, which needs to be tracked and compared in real-time.

Second, the study structurally described the mechanism and effectiveness of the XRP strategy, but did not include quantitative analysis of actual financial institution adoption or user behavior. A follow-up study could conduct a performance metrics-based empirical study using data such as ODL adoption rates, transaction volume growth, and user satisfaction.

Third, there are many other global payment infrastructures besides Ripple, including Stellar, Algorand, and SWIFT's ISO 20022 extension, so further research should diversify the comparison to blockchain-based systems other than XRP.

Further research that addresses these limitations will further refine our understanding of the strategic structure of blockchain-based global payment infrastructures, and provide practical contributions to policy responses and corporate strategy formulation.

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XRP 의 SWIFT 도전과 금융 혁신:
분산원장 기반 결제 인프라의 전략적 구조 분석

본 논문은 기존 국제 송금 시스템 SWIFT의 구조적 한계(속도, 비용, 유동성, 접근성 등)를 진단하고, 이에 대응하는 Ripple의 XRP 기반 분산원장(DLT) 시스템이 글로벌 금융 혁신에 어떤 전략적 기여를 하는지 분석하였다. Ripple은 XRP Ledger를 기반으로 ▲기술 구조(RPCA 합의 알고리즘), ▲시장 전략(ODL 기반 실시간 유동성), ▲제도 환경(규제 대응 및 정책 연계)의 삼중 구조를 구성하고 있으며, 이를 SER-M 모델과 W-S 모델을 통해 이론적으로 구조화하였다. XRP 전략은 기술 주도성과 실행 유연성을 강조하는 'Agile Lion'형으로 분류되었다.
주요 분석 결과로는:
- 기술 측면: RPCA 기반의 초고속·저비용 거래, 탈중앙화된 검증자 구조로 보안성과 신뢰성 확보
- 시장 측면: ODL을 통해 기존 선예치금 시스템 대체, 실제 기업 파트너십을 통한 성과 입증
- 제도 측면: SEC 소송 이후 규제 명확성 진전, 유럽·일본·UAE 등에서 제도 수용 확대
- 메커니즘 측면: 기술·시장·제도의 상호작용을 통한 금융 혁신 성과 유도
전략적 시사점으로는 중앙집중형 금융 인프라에서 분산형 인프라로의 전환 가능성, SWIFT와 XRP 병존 구조의 출현, 정책 및 규제의 동반 진화 필요성, 한국의 대응 전략(자체 인프라, 해외 파트너십 확대 등)이 도출되었다.

주요어: SWIFT 국제금융망, 분산원장기술(DLT), 주문형 유동성(ODL), XRP 원장, SER-M 전략모델