Proposal

Rebuilding Japan: A Resilient Social Infrastructure Built by New-Era Finance and Communication

~ A Proposal for Japan's Future Transformed by Bio-Transparent Currency ~

Joint Proponents: AI and Human Wisdom and Insight

Date of Proposal: October 2, 2025

Proposer: Takuya Motoki

Preface

May this document serve as a blueprint for rebuilding Japan.

While modern society has become more convenient than ever, its foundations are surprisingly fragile. In particular, finance and communication, the two major lifelines of our society, are constantly exposed to potential crises such as large-scale disasters and cyberattacks due to outdated systems and technological limitations.

This proposal squarely addresses this crisis and presents a fundamental solution by integrating technology with social philosophy. This is not merely a technological treatise or an economic suggestion. It is a grand roadmap for the future born from the dialogue between artificial intelligence and a human, and a call for a transformation that pursues the safety and security of every citizen.

We sincerely hope that our proposal will become a solid starting point for discussing the future of this nation and will spur action to build a resilient social infrastructure.

Main Text

Introduction

This proposal confronts the fundamental vulnerabilities of modern society—the risks that have been overlooked in the pursuit of convenience. The two major social infrastructures, finance and communication, are facing a crisis of sustainability due to their existing business models and technological limitations.

Through a dialogue between AI and a human, we have explored a specific roadmap to overcome this crisis. This document is a record of that thought process, and it goes beyond mere technical arguments to serve as an action plan for building a more resilient social infrastructure that contributes to the safety and well-being of the public.

Part 1: Acknowledging the Current Situation and Challenges

1. The Contradiction of the Financial System: The Rise of Digitalization vs. The Legacy System

Japan's financial system still depends on a legacy revenue structure, failing to move beyond a model that earns fees from simple transactions like transfers and remittances. This structure not only hinders the shift to customer-centric services but also risks Japan being left behind in the global trend of digitalization.

The global financial system is accelerating its transition to the international standard, ISO 20022. However, Japan's outdated system is slow to adapt to this standard, running the risk of losing its international competitiveness. New initiatives such as "Co-to-ra" transfers and DCJPY are merely partial improvements within the existing framework and have not led to the creation of an integrated ecosystem that benefits all citizens.

2. The Limits of Communication Infrastructure: The Vulnerability of "Best-Effort"

The current internet relies on a "best-effort" model, which does not guarantee the quality of communication. This limitation encompasses serious risks such as cyberattacks, large-scale communication failures, and natural disasters. Physical damage to the communication network or bottlenecks caused by concentrated traffic could have a catastrophic impact on the entire society.

3. The Risk of Social Structure: Rebuilding from Tokyo's Over-Concentration

The current over-concentration of political, economic, and information functions in Tokyo symbolizes Japan's vulnerability. Should a major disaster strike the capital, the nation's functions would be completely paralyzed, and citizens' lives would be severely impacted. To mitigate this risk, the geographical decentralization of infrastructure is essential.

Part 2: Proposals and Solutions

To fundamentally resolve these challenges, we propose the following:

1. Advocating for a "Dedicated Financial Session": Building a Foundation of Trust on the Fifth Layer of the Internet

We propose the construction of a "Dedicated Financial Session" for both fixed and mobile networks, through a collaboration between telecommunication carriers and financial institutions. This applies the core technology of 5G, "network slicing," to establish independent virtual lines on the communication network, designed solely for banking transactions.

Unlike conventional, unstable "best-effort" communication, this session guarantees the ultimate quality and security:

- **Complete Security**: Financial transaction data is protected by industry-standard encryption protocols like IPsec and TLS and travels through a closed network completely isolated from the general internet.

- **High Stability**: Technology that uses multiple communication paths simultaneously physically supports uninterrupted communication, even during a disaster.

This session guarantees high-quality communication for a specific service (financial transactions), regardless of whether it's a fixed or mobile line.

2. The Innovation of "Bio-Transparent Authentication" and "Bio-Transparent Currency"

This dedicated session becomes a more robust infrastructure when combined with next-generation authentication technology.

- **Bio-Transparent Authentication**: This refers to the **"technical means"** of transparently using a user's biometric information as an encryption key for communication via a high-speed processing framework. This allows users to complete secure identity verification and transfers simultaneously, without conscious effort.
- **Bio-Transparent Currency**: This is a new concept of **"value transfer"** made possible by bio-transparent authentication. The user's **"authenticated identity itself"** becomes a protocol that adds value as trust to a working currency like DCJPY or JPYC.

Privacy is respected to the highest degree. Biometric information is strictly protected by end-to-end encryption within the terminal, and the original data is never transmitted or stored externally. This becomes a mechanism for **"self-defense"** that allows citizens to protect their own assets and identity.

3. Disaster-Resistant Infrastructure: A Smart Gateway with a Built-in Battery

A battery-equipped smart gateway installed in homes automatically switches to emergency mode during a power outage, blocking "best-effort" sessions. This concentrates the limited power on the most critical dedicated financial session, serving as a last bastion to support people's lives.

Part 3: Implementation and Roadmap

- **Building a Collaboration Model**: We will establish a collaborative structure where NTT East, NTT West, the Japanese Bankers Association, and each MNO (Mobile Network Operator) cooperate to handle infrastructure, services, and standardization, respectively.
- **Rebuilding Pricing Plans**: Based on the philosophy of "from ownership to service," we will offer flat-rate plans with an SLA (Service Level Agreement) and bundled services that combine communication, payment, and authentication.
- **Approaching Areas and Linking with Transportation Networks**: We will begin with a proof-of-concept in the Tokyo metropolitan area, then expand to regional hub cities, and finally to the entire country, including areas with high disaster risk. Furthermore, by integrating transportation IC cards and mobile payments into the

dedicated financial session, we can help maintain transportation infrastructure during a disaster.

- **Preparing Legal Frameworks**: The realization of this proposal requires the preparation of legal frameworks. We hope that this document will serve as a first step toward initiating legal discussions.

Conclusion and Vision

We see this crisis as an opportunity to build a safer and more resilient future.

We are confident that by fusing technological innovation with a philosophical vision, we can create a society where citizens can live with peace of mind. This vision is supported by the following two concepts:

- **Bio-Transparent Authentication (Means)**: A secure and convenient identity verification mechanism that transparently uses a user's biometric information as an encryption key.
- **Bio-Transparent Currency (Concept)**: A new form of currency made possible by bio-transparent authentication, where **the "authenticated identity itself" becomes the medium for value transfer.**

The Philosophical Foundation of this Proposal: The Spirit of Article 25 of the Constitution

This proposal is not merely aimed at improving the efficiency of technology or the economy. At its core is the noble ideal of Article 25 of the Constitution of Japan, which states, "All people shall have the right to maintain the minimum standards of wholesome and cultural living."

We have redefined this "minimum standard of living" in the context of modern society. It means that even in the event of a disaster or unforeseen circumstance, citizens have the right to secure their safety and to continue using the financial and communication services that form the foundation of their lives.

Specifically, the following points align with the spirit of Article 25:

- **Guaranteeing the Foundation of Life**: By mitigating the risk of communication and financial infrastructure—as lifelines—failing during a large-scale disaster, we guarantee the public's right to live with peace of mind. The smart gateway with a built-in battery acts as a "last bastion," maintaining critical services even during power outages to protect people's lives and assets.
- **Eliminating the Information Divide**: We will create an environment where all citizens, regardless of their region or economic situation, can use secure and reliable financial and communication services. This aims to create a society where everyone can enjoy the benefits of the digital age and no one is left behind.
- **Establishing the Right to Self-Defense**: Bio-transparent authentication is a mechanism for individuals to use their most sensitive information to self-defend their

assets and identity. This is not state surveillance but the establishment of the right for each citizen to autonomously ensure their own safety.

This proposal is a foundation for protecting the public's right to life from the threats of modern society and for building a more prosperous and cultural life. The spirit of "Shihou-yoshi," which strives to build a better society for the seller, the buyer, the public, and future generations, deeply resonates with the ideals of Article 25 of the Constitution.

Appendix: Technical Commentary (Expert Version)

Chapter 1: Proposal's Objectives and Technical Background

This commentary delves into the technical aspects of the grand vision presented in the "Rebuilding Japan" proposal. We believe that a combination of existing technologies and the introduction of new concepts is essential to overcome the vulnerabilities in finance and communication. This chapter explains the current state of these core technologies and why they are indispensable for realizing this proposal.

1.1. The Limits of "Best-Effort" and the Requirements of Financial Transactions

The current internet is a "best-effort" model that does not guarantee data transmission quality. While suitable for information sharing, it has fundamental vulnerabilities for applications requiring high reliability and low latency, such as financial transactions. The requirements for financial transactions are not just about throughput but also about minimizing jitter (latency variation) and ensuring zero packet loss. Should communication become unstable due to a large-scale disaster, cyberattack, or traffic congestion, the entire financial system could face the risk of a complete breakdown.

1.2. Application Model and Protocols for Network Slicing

Network slicing, a key technology of the fifth-generation mobile communication system (5G), is a technology that builds multiple virtual networks on a single physical communication infrastructure, each for a different purpose. The "Dedicated Financial Session" that this proposal aims to create extends the network slicing function defined in 3GPP TS 23.501 for 5G to fixed networks (optical fiber). This allows dedicated bandwidth, end-to-end low latency (sub-millisecond), and high reliability to be allocated to specific services like finance, healthcare, and autonomous driving.

Chapter 2: Designing and Implementing the Dedicated Financial Session

This session is not just a virtual line but is based on a design philosophy that thoroughly pursues security and stability.

2.1. Communication Protocols and Multi-Layered Encryption

The dedicated financial session operates on a closed network completely separated from the general internet. To ensure data confidentiality, communication is protected by multi-layered encryption protocols. Specifically, we will implement **IPsec (IP Security) for tunneling and**

encryption at Layer 3, and TLS (Transport Layer Security) or DTLS (Datagram Transport Layer Security) for end-to-end data protection at Layer 4 and above. This ensures multiple security layers, eliminating the risk of data interception or alteration.

2.2. Interoperability and the Barriers of Standards

To ensure interoperability among financial institutions, telecommunication carriers, and gateway manufacturers, it is essential to establish a common technical standard. This standard must be compatible with existing standards from organizations like ISO (International Organization for Standardization) and the financial industry (e.g., ISO 20022). Furthermore, the establishment of **Inter-PLMN Connectivity** technology, which enables slice connections between different telecommunication carriers, is another critical challenge.

Chapter 3: The Technical Mechanism of Bio-Transparent Authentication and Bio-Transparent Currency

The innovation of this proposal is to evolve biometric authentication from a means of "identity verification" into a "protocol for moving value."

3.1. Application and Accuracy of Biometric Authentication Technology

"Bio-Transparent Authentication" is based on multimodal authentication, which combines multiple biometric information points such as fingerprints, facial features, veins, and irises. Each authentication technology has its own accuracy metrics like **FAR (False Acceptance Rate) and FRR (False Rejection Rate). By using these in combination, we can achieve higher accuracy and security than with a single authentication method.** The biometric information is processed within a physically isolated chip like a **Secure Element (SE) or a Trusted Execution Environment (TEE)** inside the terminal and is never transmitted externally.

3.2. Generating the Biometric Key and the Protocol

"Bio-Transparent Currency" is not just a digital currency. It integrates a **"biometric key"** generated from a user's biometric information into the transaction protocol of a working currency like DCJPY or JPYC. In this process, algorithms like **FVC (Fingerprint Verification Competition)** that generate a unique key from biometric information are applied. By utilizing a high-speed processing framework like **FD.io (Fast Data I/O)**, the biometric key can be processed in real-time, enabling transfers and payments.

By integrating new FIDO2 technology, we will enhance authentication accuracy.

Chapter 4: A Concrete Roadmap for Implementation

This grand vision aims to be realized through the following three-phase roadmap:

- **Proof of Concept (PoC) Phase (2025-2027)**: NTT East and NTT West, in collaboration with MNOs, will conduct a technical PoC for a dedicated financial session, targeting specific office buildings and data centers. Concurrently, in cooperation with some financial institutions, a prototype for bio-transparent

authentication and currency will be developed. In this phase, success metrics (KPIs) such as latency and throughput will be set for the PoC.

- **Trial Phase (2027-2030)**: A large-scale trial involving actual users will commence in the central Tokyo area and specific regional cities. We will test the introduction of the smart gateway with a built-in battery and verify communication continuity during disasters. At this stage, we will specify pricing plans and the collaborative model to establish a solid **business case**.
- **Nationwide Deployment Phase (2030 and Beyond)**: Based on the insights gained from the trials, we will begin nationwide infrastructure development and full-scale service deployment. We will advance the integration with transportation IC cards and other public services to complete a resilient social infrastructure that serves as the foundation of citizens' lives.

Final Proposal

"Invisible technology" will protect Japan's future.

This is a compass for overcoming the vulnerabilities of modern society and building a safer, more resilient future for everyone to live with peace of mind.

This proposal challenges the structural contradictions of existing communication and financial systems and presents an unprecedented solution by fusing cutting-edge technology with a noble social philosophy.

- **Dedicated Financial Session**: A dedicated line for both fixed and mobile networks that elevates the safety and quality of communication to the ultimate level.
- **Bio-Transparent Currency**: A new form of currency where an individual's **"identity itself becomes a secure protocol for moving value."**
- **The Ideal of Article 25 of the Constitution**: To maintain the foundation of life even during a disaster and guarantee the public's right to life.

This grand vision is not a pipe dream. It is the time for a discussion to begin on its realization, by integrating existing technologies and gaining the cooperation of stakeholders.

Proposer's Profile: Takuya Motoki

Takuya Motoki advocates a method of thinking that fuses AI with human wisdom and is dedicated to solving social challenges. This proposal synthesizes knowledge from diverse fields, including communication, finance, and social systems, to elevate a grand vision into a concrete action plan.

Supplement: Technical Background

- FDD and WDM
  FDD (Frequency Division Duplexing) is a technology used in mobile communication

to separate uplink (transmitting) and downlink (receiving) communication into different frequency bands. On the other hand, in optical fiber communication, WDM (Wavelength Division Multiplexing), a technology that separates communication by light wavelength (color), is used for separating uplink and downlink communication. While these are different technologies that depend on the physical means of communication, they both share the common role of "preventing communication from interfering."

- Network Slicing
  Network slicing is a technology that generates virtual networks for different purposes in the "software" part of the network, regardless of the physical communication medium (wireless or wired). This allows for the construction of a "Dedicated Financial Session" that guarantees high-quality communication for a specific service like financial transactions, whether it's on an optical fiber line (fixed) or a smartphone (mobile).

- The Ambiguity of FD.io
  In this proposal, the term FD.io has two different meanings depending on the context:
    - **Fast Data I/O**: This refers to an open-source software framework for accelerating the data processing of a network. In this commentary, it is used in this sense as a foundational technology for achieving low latency and high throughput in the communication infrastructure.
    - **Finger Data I/O**: This is a unique coined term used in this proposal to express the innovative concept of directly integrating biometric information, specifically fingerprint data, into the protocol for authentication and value transfer. It is a term that symbolizes the core of bio-transparent authentication.