

Policy Paper: SOLUNA Protocol

Integrating Technology and Ethics for a World Where Compassion Becomes Systemic

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1. Introduction: The Core of the Project

This proposal aims to resolve the **structural flaws (bugs)** inherent in modern social welfare systems by integrating **blockchain technology** with **Liberal Arts (Comprehensive Knowledge)**. Our goal is to construct a **new social infrastructure (Civilization OS)** where the **"value of care"** is justly recognized and circulated effectively.

We are not proposing the outright rejection of existing capitalism or welfare systems. Instead, we propose a new layer, the **Re-Verse Civilization**, that visualizes and supplements the **"invisible values"** that these existing systems have failed to capture.

2. Redefining the Challenge: Breaking the Triple Isolation Model

Current support systems are **passively designed**, requiring people to send out an "SOS signal (application)." However, those truly in need of rescue are often trapped behind the following **"Three Walls of Isolation,"** unable even to voice their distress:

- **Institutional Gap:** Individuals with complex challenges (e.g., mental illness, poverty, and care needs) fall through the gaps of **vertically siloed public administration**.
- **Cultural Oppression:** Societal pressure and the **"Culture of Shame"** make it difficult to disclose domestic problems to external parties.
- **Closed Family System:** Children and vulnerable individuals become completely isolated and helpless within families that reject external intervention.

The SOLUNA Protocol seeks to dismantle this isolation not through physical intervention in the home, but through **technological "infiltration"** from within.

3. Technological Imperative: Why Web3 is Indispensable

To resolve "invisible isolation" and realize a society where compassion circulates, reliance on existing Web2 technology (centralized servers) is impossible. The adoption of **Web3 technology is not a choice, but a necessary condition**.

(1) Immutable Proof

- **Challenge:** Points issued by public and private entities can easily lose value due to **"adult circumstances"** such as budget constraints or policy shifts by the issuer.
- **SOLUNA Solution:** Care tokens on the blockchain are autonomously managed by **Smart Contracts**. This ensures that children's efforts and care labor are stored as a **permanent value, much like a law of physics**.



(2) Permissionless Care

- **Challenge:** Existing application windows are often blocked by the **subjectivity or bias of the caseworkers**, and the **shame (stigma)** experienced by the individuals, preventing crucial SOS signals from being received.
- **SOLUNA Solution:** The decision to provide aid is **automatically executed by code**. Because the counterparty is a **"fair system"** rather than a human, individuals can send their SOS without feeling hesitant or ashamed, maintaining their **psychological safety**.

(3) Zero-Knowledge Truth

- **Challenge:** The current necessity of exposing **"all personal information"** to public administration in order to receive aid is too high a hurdle for families concerned with privacy and social standing.
- **SOLUNA Solution:** By utilizing **Zero-Knowledge Proof (ZKP)** technology, only the fact **"that a state of need exists"** can be proven, while preserving **"the identity of the person."** This technologically resolves the contradiction between privacy and transparency, which was previously deemed impossible to reconcile.

4. Scientific Basis: Designed Based on World-Class Evidence and Theory

— Insights from Johns Hopkins University Data and University of Minnesota Theory —

The design philosophy of the SOLUNA Protocol is grounded in research data from the world's leading institutions in public health and developmental psychology. This is a scientific social implementation model that stands apart from the Japanese self-help ideological approach (the **"Self-Responsibility Model"**).

(1) Epidemiological Evidence: The Threat of ACEs and "Toxic Stress" Research data from **Johns Hopkins University** indicates that **Adverse Childhood Experiences (ACEs)** are not merely psychological trauma but are embedded in the body as **"Toxic Stress,"** dramatically increasing the risk of adult diseases such as heart disease, diabetes, and depression. Data from the University's CAHMI (Child and Adolescent Health Measurement Initiative) shows that **"Connection"** to family and community is a **critical protective factor** for the healthy development (**flourishing**) of children facing adversity.

- *Figure 1 (Not translated): Risk-Attributable Deaths in the Working-Age Population (15-49 years) in Tokyo (2021).*
- *(Source: GBD Compare / Analysis based on Johns Hopkins University Public Health Data)*



(2) Redefining Resilience: "Ordinary Magic" The science behind this "Connection" was systematically defined by Professor Ann Masten of the **University of Minnesota**. She defines **Resilience** not as the "special ability of a select individual," but as the **"process by**

which an individual connects with environmental resources." This is known as **"Ordinary Magic."**

- **Contrast with the Japanese Context:** In Japan, a self-help ideology, which holds that "adversity must be overcome by individual strength," is deeply rooted. Scientifically, this acts to **"deepen isolation and destroy resilience."**
- **SOLUNA Approach:** Based on Professor Masten's theory, SOLUNA does not rely on "individual strength" but **automatically provides "environmental connection (Ordinary Magic)" as a system.**

(3) Conclusion: Web3 as Scientific Necessity To deliver **"Ordinary Magic" (support resources)** to a brain compromised by **"Toxic Stress (ACEs)"** and unable to send an SOS, **trustless connection technology (Web3)**, which requires no human intermediary, is indispensable. SOLUNA is the **sole social implementation solution** to bridge this scientific missing link.

5. Social Impact and Economic Rationality (ROI)

This project is not mere philanthropy; it is an **economically rational investment** that will reduce the social costs currently straining national finances.

Economic Benefits of ACEs Countermeasures

- **Current Loss:** Social losses caused by adult diseases (depression, addiction, etc.) and employment difficulties attributable to ACEs amount to **trillions of yen annually** (medical costs, welfare expenditures, and productivity decline).
- **Overwhelming ROI: Low-cost, early intervention (prevention)** through SOLUNA negates the need for **high-cost, post-event treatment** after conditions become severe. This is not simply a consumption of the welfare budget, but the **highest-return public investment** for protecting future tax revenues and human capital.

6. Implementation Roadmap and Concluding Remarks

Implementation Phases (Japan Pilot Case)

1. **Phase 1 (~2026): Technical Demonstration** Testnet launch and PoC (Proof of Concept) in collaboration with NPOs. Confirming the detection accuracy of **"invisible SOS."**



2. **Phase 2 (2026–2028): Local Government Collaboration** Model project expansion in specific regions utilizing structural reform special zones. Data linkage testing with public administration support systems.

3. **Phase 3 (2029~): National Infrastructure Integration** Full-scale operation as a Social OS. Nationwide deployment through linkage with systems such as the My Number platform.

Concluding Remarks We respond to the pain that has been dismissed by the phrase "self-responsibility" with technology, philosophy, and world-leading evidence. SOLUNA is the first step toward a world that systematically guarantees the "right to connection" and "dignity of life," which are inherent to every person from birth.

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※ **What is a Liberal Arts Architect:** A designer who reconstructs social systems to be more empathetic to the human heart, using "Comprehensive Knowledge"—an integration of philosophy, art, and science—to bridge the divide between technology (science) and humanity (liberal arts).

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