

Securing the Future of Finance

Integrating information security and quantitative risk into RWA for enhanced operational resilience and investor protection.

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INTRODUCTION

Real-World Asset (RWA) tokenization has evolved from pilot projects to core financial infrastructure, with on-chain RWAs exceeding \$35 billion in 2025 and projected to reach \$2–4 trillion by 2030. Despite rapid growth; systemic barriers, regulatory friction (84.6% of issuers), low secondary market activity, and compliance fragmentation, prevent scalable liquidity. Most tokenized assets are issued but rarely traded, constrained by off-chain whitelisting, custodial concentration, and reactive compliance.

RESEARCH Questions

In what ways can the integration of ISO 27001 and the FAIR model reduce key security and smart contract vulnerabilities in the development of RWA systems?

By what means can regulatory friction be reduced when rolling out tokenized RWA?

How do emerging regulations (e.g., MiCA and DORA) and secure software development contribute to operational resilience in RWA systems?

Hypothesis

Embedding ISO 27001, FAIR, and EU regulatory controls (MiCA/DORA) into RWA tokenization infrastructure will reduce smart contract vulnerabilities, lower regulatory friction, and strengthen operational resilience compared to conventional, reactive compliance approaches. By enabling jurisdiction-aware transfer rules, on-chain compliance, and institutional enforceability, the following integrated framework lays the foundational conditions for secondary market liquidity, transforming RWA from issuance-centric models into compliant, interoperable, and liquidity-ready systems.

Summary of Literature Review

Liquidity Constraints: Swinkels (2024) and Laschinger et al. (2025) show most RWA tokens exhibit low turnover, long holding periods, and OTC reliance, challenging blockchain's liquidity promise.

Compliance Fragmentation: Chen et al. (2024) and Kremer et al. (2025) identify gaps in oracles and custody; no framework unifies ISO 27001 (secure SDLC), FAIR (risk quantification), and ERC-3643 (on-chain rules).

Legal Uncertainty: Tokeny (2025), AICerts (2025), and Katten (2025) highlight unresolved issues in title transfer and cross-border recognition.

Regulatory Friction: Brickken (2026) reports 84.6% of issuers face regulatory hurdles, with only 13% citing tech limitations, confirming compliance as the bottleneck.

Market Shift: Equity (28.6%) and IP (17.9%) now dominate RWA tokenization, surpassing real estate (10.7%). This shift reflects demand for assets with clearer valuation, stronger investor rights, and better alignment with securities regulations. Issuers prioritize compliant capital formation, making equity and IP the foundation for scalable, institutionally trusted markets.

METHODOLOGY

- Design Science Research (DSR) framework with four iterative cycles:
- Problem Identification: Regulatory analysis (MiCA, DORA) and literature review.
- Artifact Design: Develop smart contracts, Back-end logic and Front-end
- Operational Resilience Integration: Implement DORA controls, ISO 27001-aligned SDLC, audit trails.
- Validation & Generalization: Test and deploy on Testnet, security audit, academic publication.



Figure 1: Why Issuers Tokenize

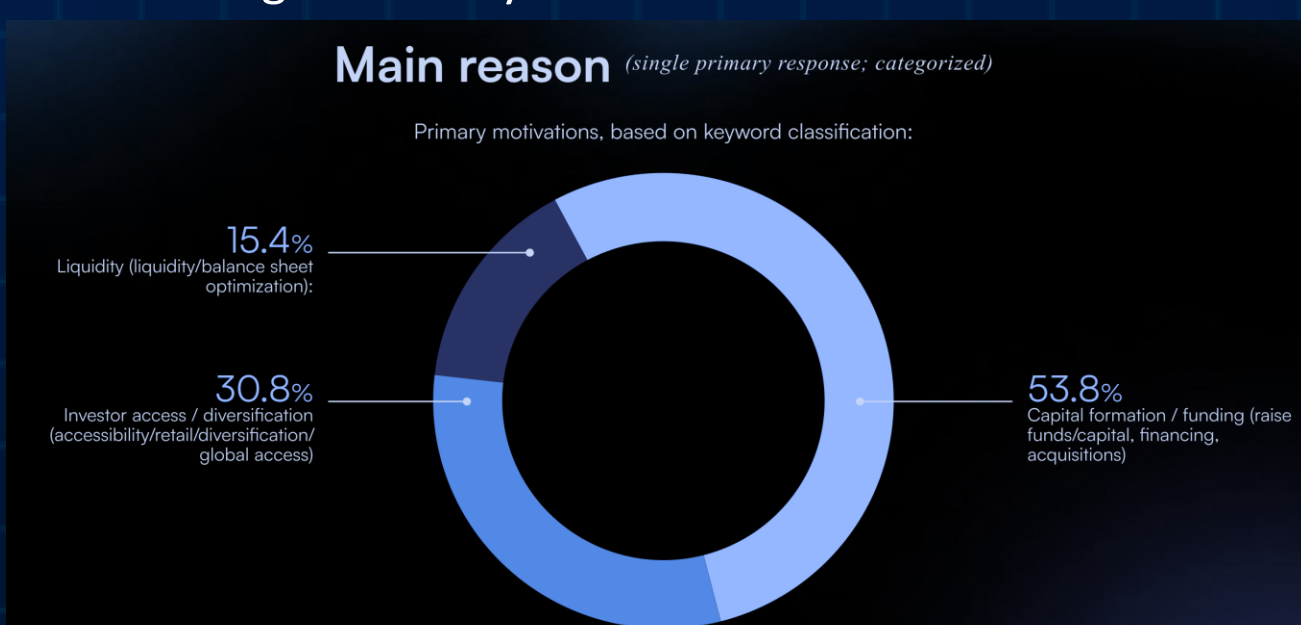
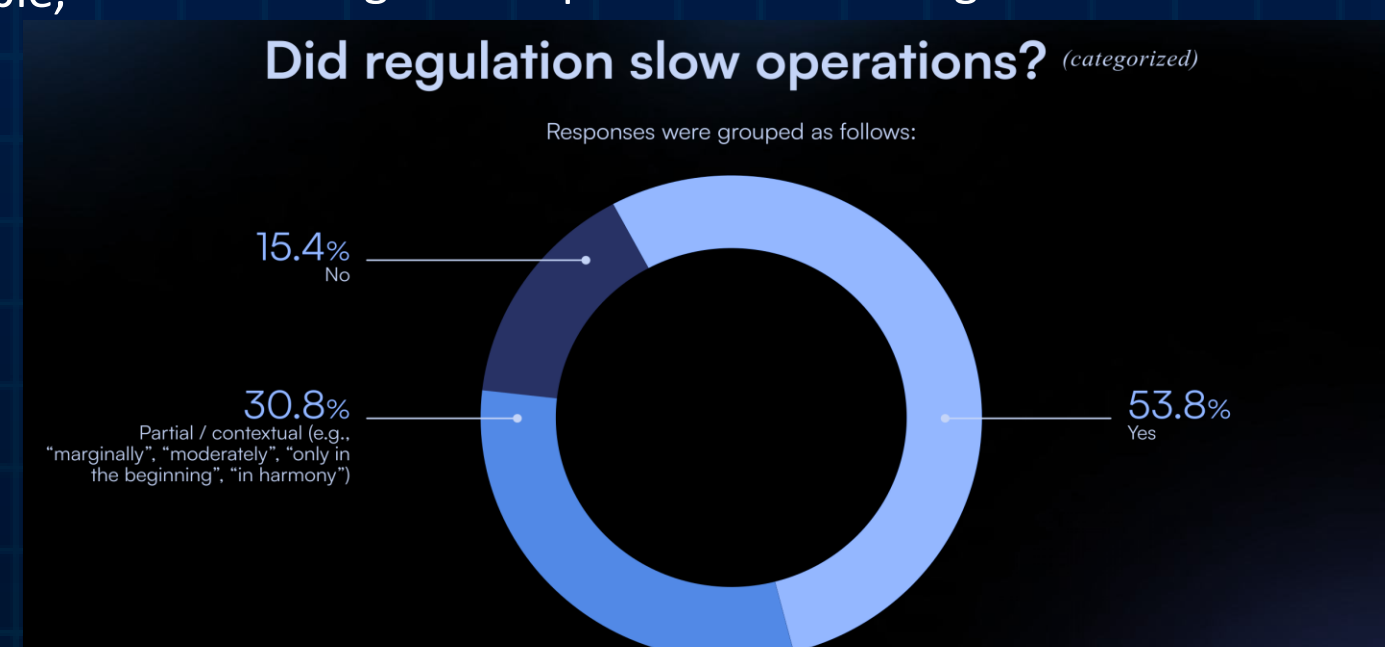


Figure 2: Operational challenges



Next Steps

- Institutional On/Off-Ramping: Integrate Chainlink CRE for bidirectional ISO 20022 blockchain message translation via SWIFT gpi (converting legacy or outdated MX formats)
- Private Execution: Deploy Confidential Intents for AI-driven, private execution, cross-chain routing (allowing financial institutions to express transaction intent, without exposing trade size, route, or strategy, protecting against MEV and front-running, while protecting institutional strategies without compromising auditability)