

DLT for FMI: What is Missing?

Insight from a Multi-Stakeholder Roundtable

July 2025

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Introduction

Distributed ledger technology (DLT) is frequently highlighted as a game-changer for financial market infrastructure (FMI). Yet despite numerous pilots, proofs of concept, and even some production deployments, DLT has neither replaced nor fundamentally transformed today's financial markets. Its adoption remains largely limited to niche applications.

To better understand why, a cross-sector roundtable brought together participants from financial institutions, infrastructure providers, and legal experts. The objective was not to revisit past initiatives or debate DLT's theoretical potential, but to explore the concrete reasons behind its slow adoption, and to identify the practical, legal, and institutional barriers to widescale adoption.

The discussion revealed broad agreement that DLT is technically viable for financial market use cases and that legal frameworks, while uneven, are becoming clearer in some jurisdictions. Yet participants also identified persistent barriers, economic, legal, operational, and cultural, that continue to constrain broader uptake. This report summarises those challenges, organised around six key themes that describe the current state of play and outline the preconditions for broader adoption.

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DLT Faces Systems Integration and Commercial Challenges

Participants agreed that DLT has moved beyond the experimental stage. Concrete examples, such as tokenised deposits, intercompany repurchase agreements (repos), and digital bond issuances, demonstrate that the technology can deliver operational efficiencies and cost savings.

Despite this technical progress, most initiatives remain limited in scale. They are typically confined to individual institutions or tightly controlled pilots, with few extending to broader market integration. As a result, meaningful scalability continues to lag.

The primary barriers to DLT adoption are no longer technological. The challenge now lies in systems integration: how to connect, coordinate, and scale across fragmented legal, operational, and institutional environments? At the same time, financial institutions are under growing pressure to prioritise initiatives that deliver measurable business outcomes.

Participants highlighted several obstacles in this regard:

- 1 Many DLT implementations operate in isolation, lacking involvement from external counterparties or integration across institutions.
- 2 Technical standards, APIs, and governance models remain poorly aligned across networks.
- 3 Leadership increasingly expects innovation to support cost savings or generate revenue growth.

These combined integration and commercial challenges underscore a need for more collaborative, strategically aligned approaches, particularly those that not only prove feasibility, but also deliver sustained and scalable value across the financial system.



Interoperability and Standardisation

Interoperability was identified as one of the most significant structural barriers to broader DLT adoption. Participants largely agreed that cross-platform compatibility and shared infrastructure layers are essential enablers for realising the full potential of DLT at scale.

Current fragmentation across DLT platforms, even within the same jurisdiction, results in a patchwork of protocols, standards, and governance models. Participants also highlighted the importance of alignment of legal and operational frameworks. Without consistency in how digital assets are represented, settled, and enforced, technical interoperability alone will not be sufficient.

Institutions further emphasised the necessity of bridging mechanisms with legacy systems. Seamless interaction between DLT platforms and traditional financial infrastructure was seen as a key precondition for adoption.

Finally, governance emerged as a decisive factor. A shared infrastructure cannot succeed without trusted, transparent governance that accommodates diverse institutional interests while upholding reliability and accountability.

Key challenges identified include:

- 1 **Performance and scalability limitations**, particularly when using advanced cryptographic methods such as zero-knowledge proofs or executing complex smart contracts. These introduce significant computational overhead, which can become a bottleneck at scale.
- 2 **Lack of integration tooling and middleware** to bridge DLT systems with existing enterprise architecture, which remains largely siloed and tailored to conventional processes.
- 3 **Limited institutional readiness**: Many organizations lack the internal expertise required to operate, audit, and govern distributed systems. This includes both technical knowledge and the organisational capacity to adapt to the new operational paradigms that DLT demands.

Participants emphasised that these challenges stem largely from a persistent gap between technical design and operational readiness. Even where DLT-based solutions perform well in isolated environments, scaling them to meet the institutional-grade requirements of FMIs, such as continuous uptime, real-time reconciliation, and robust incident response, is non-trivial.

There was broad consensus that successful adoption of DLT depends not only on the introduction of new technical capabilities but also on the operational resilience, usability, and seamless integration of these systems within existing institutional frameworks.

Technology Maturity and Operational Complexity

While DLT offers new functionalities like programmability, atomic settlement and cryptographic privacy, these advances introduce operational challenges that constrain adoption. Participants noted that many financial institutions are not equipped to absorb such technical innovations without substantial process reengineering.

Regulatory and Legal Clarity is Uneven Across Jurisdictions

Participants broadly recognised that legal and regulatory certainty plays a critical enabling role in DLT adoption. Some jurisdictions like Switzerland have taken decisive steps by introducing clear legal frameworks for digital assets, tokenised securities, and DLT-based settlement systems.

However, legal and regulatory progress remains uneven globally. Key areas where gaps persist include:

- 1 The legal status and treatment of tokenised money,
- 2 The enforceability of settlement finality and the clarity of ownership rights, especially in insolvency or cross-platform scenarios,
- 3 The lack of regulatory interoperability across borders, which complicates multi-jurisdictional transactions.

Inconsistent legal standards and unclear regulatory positions expose institutions to significant uncertainty. This inhibits investment, increases compliance risk, and often limits DLT initiatives to domestic pilots or tightly controlled environments. Without more harmonised legal and regulatory frameworks, broader adoption will likely remain constrained.

5 Permissioned vs. Permissionless Blockchains: An Ongoing Debate

A central point of divergence during the roundtable discussion was the debate over infrastructure models, specifically the trade-offs between permissioned and permissionless blockchains. This topic remains an area of discussion, with differing perspectives on their suitability for various use cases.

Some participants argued that permissionless systems are essential for ensuring open access, fostering long-term innovation, and enabling global scalability. They emphasised that these systems, particularly those based on public blockchains, offer greater decentralisation and flexibility, which are important for innovation in the broader financial ecosystem.

In contrast, others advocated for permissioned blockchains, citing their stronger compliance controls and well-defined governance structures. They noted that these attributes make permissioned systems more suitable for regulatory environments, especially in industries like financial services, where legal certainty and oversight are paramount.

Participants generally agreed that this debate is unlikely to reach a resolution in the near future. A potential pragmatic solution discussed was network layering, providing permissioned environments with selective interoperability into permissionless ecosystems, based on the specific requirements of the use case and the regulatory context of

the jurisdiction. This layered approach could allow the best of both worlds, enabling flexibility without sacrificing control.

The conversation underscored the importance of infrastructure flexibility and regulatory responsiveness. Participants recognised that as the legal and market landscapes evolve, the choice of blockchain infrastructure may also adapt. This evolving landscape calls for ongoing dialogue between technologists, regulators, and market participants to ensure that infrastructure models remain aligned with both regulatory frameworks and market needs.

6 DLT Adoption Requires a Long-term Perspective and Patience

A consistent message across the roundtable was the need for long-term perspective when considering DLT adoption. FMs are complex, highly regulated, and deeply interconnected systems with strong path dependency and entrenched network effects. As such, transformation in this space is inherently gradual and measured—not something achieved over quarters, but over years.

Participants reflected on historical infrastructure shifts, such as the introduction of ISO messaging standards, SWIFT network and the adoption of central clearing to illustrate the patience required. These shifts did not yield immediate returns but were realised through sustained, multi-year efforts involving alignment across jurisdictions, regulatory bodies, and private institutions.

Key observations from the discussion included:

- 1 Premature scaling could lead to fragmentation or reputational risk, especially in a globally connected environment.
- 2 Progressive deployment models starting with private deployments and moving to broader integration may be more realistic.

Strategic patience paired with ongoing experimentation can allow the ecosystem to learn, adapt, and demonstrate value incrementally. Ultimately, DLT was framed not as a disruptive force requiring immediate overhaul, but as a potential foundational enabler of future-state finance. Successful integration will depend on steady progress,

institutional alignment, and the willingness to and demand for evolve infrastructure over time.

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Key Insights and Next Steps

The roundtable concluded that the long-term potential of DLT in FMIs remains compelling. However, systemic adoption will depend on addressing both foundational enablers and institutional behaviours that shape market dynamics.

Moving forward, four priorities stand out:

1 Make the business case real:

Focus on use cases that deliver measurable value in the short to medium term.

2 Clarify legal and regulatory frameworks:

Build clearer, harmonized regulatory frameworks across jurisdictions through multi-stakeholder collaboration.

3 Build bridges, not silos:

Develop interoperable systems and governance models that work across platforms and borders.

4 Commit to a long-term transition:

Accept that transforming financial infrastructure takes time, patience, and coordination.

While participants differed on timelines and tactical approaches, there was broad alignment on the strategic direction. DLT is not an overnight replacement for existing systems, but a foundational technology with the potential to reshape market infrastructure, guided by long-term vision and grounded in practical implementation.



Participants

The roundtable took place in Zürich on 7 May 2025, as part of the Point Zero Forum. Hosted by the Swiss National Bank, the session was moderated by **Thomas Moser**, Alternate Member of the Governing Board. Participants included:

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