Establishing a New Foundation for Trust: How Besu Helps Governments Meet Citizen Needs While Rebuilding Credibility

Trust Without Centralization

- **EBSI:** Implements a multi-layered approach with permissioned blockchain to operate across the European Union and associated countries in support of a range of applications in compliance with EU regulations, notably its data protection regulation (GDPR).
- **LACChain Ecosystem and LACNet Networks:** Executed by the neutral non-profit LACNet, which orchestrates the network without controlling it, enabling standardized infrastructure with local adaptations.
- **RBB:** Distributes validators across different branches and levels of government, as well as other types of institutions considered to be of public interest, to create institutional checks and balances within the validation process itself

Cross-Jurisdiction Governance

- **EBSI:** Designed to work within complex EU regulatory frameworks through collaboration with policymakers and technical experts, with a dedicated governance body for EBSI.
- **LACChain Ecosystem and LACNet Networks:** Develops sector-specific approaches tailored to regional priorities across Latin America's diverse regulatory landscape
- **RBB:** Creates equal voting rights for validators regardless of government level while keeping decision-making transparent through on-chain processes. Temporarily, the founders have the right to veto.

Incentives Without Coins

- **EBSI:** Drives participation through EU policy objectives and the transition to the production phase that brings in application providers
- **LACChain Ecosystem and LACNet Networks:** Operates purpose-built, public-permissioned networks without a native token, ensuring predictable costs and an institutional-friendly payment model without using cryptocurrencies.
- **RBB:** Developing a "gasonomics" system with sanctions and incentives that works without traditional cryptocurrency

Trust in governments has reached concerning lows across much of the world. According to the 2025 Edelman Trust Barometer, 60% of surveyed countries have populations that distrust them.

This creates fundamental challenges for effective governance. This isn't merely about political popularity. It undermines the basic relationship between citizens and the state.

When public trust erodes:

- Policies face resistance regardless of their merit
- Resources shift toward oversight rather than direct service delivery
- Civic participation declines across multiple channels of engagement
- Social cohesion weakens as institutional legitimacy is questioned

Traditional trust-building approaches like improved transparency, stronger accountability, and more responsive services are essential. But those operate on extended timelines. Meanwhile, governments face challenges that demand action now.

With this timing mismatch, how can public institutions function effectively today while simultaneously rebuilding the trust needed for tomorrow?

Three regions are using technical innovations to address this challenge.

1. **European Blockchain Services Infrastructure (EBSI)** - The EU's cross-border verification platform
2. **LACChain** - Latin America's regional blockchain ecosystem
3. **Rede Blockchain Brasil (RBB)** - Brazil's national transparency initiative

These are diverse projects united in their approach.

They all use blockchain's inherent properties of transparency, immutability, and decentralized validation to create government services where trust isn't requested from citizens because it's engineered into the system itself.

Public Blockchain Challenges

Government blockchain projects face challenges rarely encountered to the same degree in the private sector.

1. **Balancing transparency with security:** Unlike private companies that prioritize security over transparency, public institutions must achieve both simultaneously to fulfill their accountability mandate.
2. **Multi-stakeholder governance:** Public blockchain networks often span multiple agencies, jurisdictions, and countries with different legal frameworks. This complexity exceeds typical enterprise organizations.
3. **Building public trust:** While private sector blockchain projects typically focus on improved efficiency among partners that share aligned interests, public sector implementations must convince a diverse citizenry with varying degrees of existing distrust.
4. **Vendor neutrality and cost efficiency:** Government procurement can be constrained by budget limits, bidding requirements, and technology neutrality policies. The private sector can more freely select proprietary solutions or accept higher costs for preferred features.

5. **Interoperability with legacy systems:** Public institutions must integrate blockchain solutions with decades-old systems while ensuring future compatibility with emerging networks. This interoperability challenge exceeds what most businesses face in scale and complexity.

How Besu Addresses These Challenges

Besu, a project of LF Decentralized Trust, has capabilities that directly address these challenges.

1. **Transparency plus security:** Besu's Proof of Authority (PoA) consensus protocols create a governance-friendly validation mechanism balancing control with resilience. This mechanism (Quorum Byzantine Fault Tolerance, or QBFT) allows government networks to maintain appropriate oversight while ensuring system integrity even if some validators experience failures.
2. **Multi-stakeholder governance:** With on-chain permissioning, Besu enables transparent, rule-based governance where participation and validation rights are managed through the blockchain instead of on external systems. This creates auditable governance even for complex relationships.
3. **Building public trust:** As an open source platform, Besu's code is publicly available for inspection. This openness helps establish legitimacy, and it reduces initial implementation costs.
4. **Vendor neutral and cost effective:** Besu's vendor neutrality, maturity in production environments, and absence of licensing fees make it suitable for public sector procurement requirements. The platform enables compliance with bidding and neutrality policies standard in government technology adoption.
5. **Interoperability with legacy systems:** Besu is compatible with permissioned and public blockchain architectures and Ethereum Virtual Machine (EVM), allowing smart contract execution. Governments can operate private networks while maintaining pathways to integration with other systems and future technologies.

These three regions with distinct needs and governance structures all selected Besu, indicating a maturing consensus about appropriate blockchain architecture for public sector uses.

European Blockchain Services Infrastructure: Spanning the Trust Gap

The European Blockchain Services Infrastructure (EBSI) is a joint initiative founded by the European Commission and Member States. Its goal is to create a digital infrastructure across Europe in support of public policies, with particular focus on public sector actors.

EBSI tackles trust building on a continental scale, spanning 27 EU member states, with potential expansion to associated countries with different legal

systems, languages, and public administration traditions. This multi-national scope introduces governance challenges single-country initiatives don't face.

EBSI enables enhanced verification processes for documents, products, and legal entities. "Traditional methods are costly, inefficient, and vulnerable," José Manuel Panizo Plaza, EBSI team leader, explains. "They lack trust, leading to possible identity theft, counterfeit goods, and corporate fraud."

Engineering a framework for European values

EBSI's technical architecture was designed to align with EU regulatory frameworks and values. The choice of Besu as its blockchain foundation was driven by specific technical requirements.

The open source nature of the blockchain was non-negotiable for this public initiative. "It was the European Commission (EC) and Member States requirement to use open source technologies and to offer the EBSI as a public service," Panizo Plaza says.

After evaluating the advantages of QBFT over IBFT, the EC adopted QBFT as the network's consensus mechanism, so the EC and EBSI stakeholders needed the blockchain client to support that. Other criteria were a level of maturity, an active community supporting the project, EVM compatibility, and clear documentation.

EBSI's node operators are organizations endorsed by EU Member States or their designated representatives through a structured onboarding process that ensures both technical capability and institutional legitimacy.

EBSI's approach balances transparency and Europe's stringent privacy requirements.

"EBSI ensures security and privacy through a multilayer approach," explains Panizo Plaza. "A permissioned blockchain restricts participation to approved European entities, minimizing unauthorized access risks. And EBSI does not store personal information on chain."

Instead, EBSI establishes a trusted and verifiable data registry designed to store the legal entity information required for validating domain-based verifiable credentials. This validation process includes standardized data schemas, a complete trust chain of issuers, and the accreditation of all actors involved in the ecosystem.

Building the bridge

The implementation hasn't been without difficulties. "The biggest challenge EBSI faced was achieving broad adoption and interoperability across member states, service providers and domains, each with its own business requirements and legacy systems," Panizo Plaza acknowledges. To overcome this, EBSI worked closely with policymakers, industry stakeholders, and technical experts to establish common standards and ensure compliance with EU regulations.

EBSI's technical infrastructure has evolved to meet these complex needs. The network currently operates in multiple environments, from development and testing environments with up to 40 blockchain nodes.

At its core, EBSI implements a comprehensive Verifiable Credentials (VC) framework with trusted registries for Decentralized Identifiers (DIDs), schemas, and trusted issuers. This framework is the foundation for verifiable yet privacy-preserving digital interactions across Europe.

The project has connected stakeholders across Europe, with over 350 organizations participating in pilot programs spanning education, healthcare, social security, banking, and supply chain sectors. Some of the applications include:

- Universities and ministries issuing diplomas as verifiable credentials
- Cross-border verification of social security contributions for posted workers
- Municipality-issued digital credentials for accessing public services
- Blockchain-based verification of metrology certified devices
- Brand ownership verification in partnership with EUIPO.

Looking toward the future, EBSI is transitioning from development to production with a new governance structure. It will transition governance to EUROPEUM-EDIC, a purpose-built legal entity created to oversee the network's operational phase.

"This dedicated structure ensures appropriate governance as we move from production-grade network to go live," explains Panizo Plaza.

LACChain Ecosystem and LACNet Networks: Cultivating Digital Trust Across a Diverse Region

LACChain addressed specific trust-related challenges facing Latin American governments and institutions. It launched in March 2019, as part of an IDB Lab initiative to promote the growth of the blockchain ecosystem in the region. This collaborative initiative brought together governments, multilateral organizations, and private sector actors to explore and implement digital solutions fr inclusion and development.

The public-permissioned blockchain infrastructure that underpins the LACChain ecosystem solutions is currently provided and operated by LACNet, a neutral, international nonprofit founded by LACNIC and RedCLARA in collaboration with IDB Lab within the framework of the LACChain ecosystem.

LACNet ensures the continuity, governance, and sustainability of the network, maintaining an environment aligned with international standards, interoperability requirements, and local regulatory contexts.

Growing a network with regional roots

The governance model reflects LACChain's regional character. "LACNet is responsible for providing governance to the network, including security requirements for validators and boot nodes," explains Ilan Melendez, Regional Lead for LACChain. This structure helps coordinate across diverse jurisdictions and institutional contexts.

"LACNet provides network governance that balances regional representation with technical expertise," says Melendez. "This creates legitimacy that no single-country initiative could achieve."

With more maturity than many public blockchain projects, LACChain can focus on more complex issues, like helping central banks navigate new digital currency frontiers. "Several Latin American Central Banks don't know how to take the first steps to explore digital currency (CBDC)," says Melendez. "CBDC is a novel proposal that brings controversy and opportunities."

LACChain's CBDC work represents a cornerstone of its strategy in financial innovation. "We're in the design phase of a Digital Public Good (DPG) for CBDCs issuance," Melendez explains.

This isn't merely a technological solution. "Governments and corporations need solutions, not just technology," Melendez says. "It's a comprehensive framework designed to be accessible to all Latin American central banks, providing them with a neutral, tested foundation rather than having each bank develop isolated systems."

Keeping Besu as the technical foundation reflects these trust requirements. "Besu is the underlying tech that LACChain deploys," Melendez explains. "It is the only protocol widely adopted that we consider mature enough and neutral from any vendor in the market."

From financial seeds to development harvest

LACChain's vision extends beyond financial applications to broader development goals. "We promote strategic use cases to solve real-world problems and engage strategic partners like IFAD to maximize adoption," says Melendez. IFAD, the International Fund for Agricultural Development, is a specialized United Nations agency focused on rural poverty reduction and agricultural development.

Rather than creating many small private networks, LACChain envisions purpose-specific networks for applications like CBDCs and financial use cases, all operating within a coordinated regional ecosystem that maximizes knowledge sharing and interoperability while respecting local regulatory contexts.

Rede Blockchain Brasil: A Blueprint for Governance

Public skepticism about government processes impacts everything from policy implementation to the functioning of essential institutions, including banks like the Brazilian Development Bank (BNDES). BNDES is a federal public company associated with Brazil's Ministry of Development, Industry, Trade and Services. It provides long-term financing for projects contributing to Brazil's economic and social development, particularly in infrastructure, industry, and environmental sustainability.

"Trust of citizens in government processes is one of the most important problems in democracies, especially in those that are maturing," explains Gladstone Arantes Jr, Blockchain Specialist at BNDES. "It affects the whole country and society, but BNDES can be especially affected. Political movements that disagree with the Bank's activities can exploit the distrust to attack what they don't like."

Designing a network as diverse as Brazil itself

To establish trust in BNDES and across public institutions, BNDES joined Rede Blockchain Brasil (RBB) as a founding member. The initial Cohort includes the Federal Court of Accounts and a mix of public and private companies.

RBB deliberately distributes validation authority across the Brazilian governance ecosystem.

"We incentivize the participation of different powers (executive, legislative, judiciary) and different levels of the republic (federal, state, and municipal)," says Arantes. "This diversity of validators is strategic. By ensuring representation across different powers and levels of government, we create a system where institutional checks and balances are built into the validation process itself."

This governance model is formalized through a distinctive voting structure. "Everyone with a validator has the right to vote in the decisions, while others have a voice but no vote," explains Arantes. "Participation is limited to government and non-profit institutions—a requirement consistent with our public-focused Proof of Authority network. This restriction ensures the network remains aligned with public interests rather than commercial ones."

This distributed governance model addresses the balancing of transparency with security that many government blockchain initiatives struggle with. "The biggest challenge is not technical," Arantes explains. "It's the mix of transparency, incentives, security, control, and decentralization. We need to make everything transparent without compromising the network's security."

Laying the technical foundation for the future

RBB's selection of Besu stems from its governance requirements.

"We saw how it was used for LACChain. And that it had a lot of software development in EVM," says Arantes. "Besu is also adaptable to mixed

architecture and is the only permissioned client that promised to maintain compatibility with all architectures - public, private and public-permissioned."

Besu being an open source platform with no licensing fees was also helpful. "Keeping initial costs low is important in a regulatory environment where it is challenging to buy anything," Arantes says.

RBB is actively developing with 13 participating organizations with more to come. The project continues to evolve its governance model.

"We're developing sophisticated on-chain governance protocols," says Arantes. "The challenge is maintaining radical transparency while ensuring network security; finding that balance is our ongoing mission."

Looking beyond governance, RBB is developing an innovative economic model they call "gasonomics," which will incentivize participation without using traditional cryptocurrency like Ether. "We're building an extended protocol with an incident management system that includes sanctions and incentives based on gasonomics," explains Arantes. "We're currently simulating this to establish the right parameters. It's an innovative approach to public blockchain incentives that aligns with government requirements."

This is a complex mission, so RBB is building it step by step along with the growth of the network itself.

Looking forward, RBB envisions potential integration with other blockchain initiatives, shares Arantes. "There is still a lot we can build."

Lessons and Future Horizons

All three networks employ carefully designed governance systems to ensure balanced representation. And all three ultimately rely on carefully designed governance structures.

But that's not all they have in common.

They also share similar advice to other governments looking to build trust with public blockchain projects:

Reconceptualize trust as a core infrastructure rather than an add-on feature.

"You must think deeply about your governance model from the beginning," advises Arantes. "You're building a network where governance alignment with your business model is foundational, not supplemental."

This revolution in public trust infrastructure is still in its early stages. Still, these initiatives show how blockchain-based verification can allow effective governance in the present while rebuilding trust for the future.

About LF Decentralized Trust

LF Decentralized Trust is the neutral home for the open development of technologies that empower organizations to innovate with secure and resilient

code. It is the Linux Foundation's flagship organization for a broad range of technologies and standards that deliver the transparency, reliability, security, and efficiency required for a digital-first economy. Supported by a diverse, global base of members and communities, LF Decentralized Trust champions open source best practices across a growing ecosystem of blockchain, ledger, identity, cryptographic, and related technologies. To learn more, visit: www.lfdecentralizedtrust.org.

About EBSI

The European Blockchain Service Infrastructure (EBSI) is a joint initiative founded by the European Commission and Member States. It's aimed at creating a blockchain-based digital infrastructure for the public sector across Europe. **EBSI's vision is to build a secure, trusted, and resilient infrastructure** that enables public services to operate more efficiently, transparently, and cost-effectively. EBSI is funded by the Digital Europe Programme (DIGITAL), an EU funding program focused on bringing digital technology to businesses, citizens, and public administrations. To learn more about EBSI, visit https://ec.europa.eu/digital-building-blocks/sites/display/EBSI.

About LACChain

LACChain is a global alliance of participants in the blockchain environment. It's led by the Innovation Laboratory of the Inter-American Development Bank Group (IDB Lab). LACChain develops and maintains a cohesive blockchain ecosystem in Latin America and the Caribbean.
To learn more about LACChain, visit https://www.lacchain.net/home.

About LACNet

LACNet is a neutral, non-profit operator of public-permissioned, enterprise-grade blockchain networks. It operates multipurpose networks—quantum-resistant and fully compliant with regulatory frameworks—providing accessible, secure, and decentralized environments where enterprises, governments, NGOs, and startups can build and scale innovative solutions with predictable costs and institutional-grade reliability.

LACNet was founded in 2021, it is an independent nonprofit entity resulting from the collaboration between RedCLARA and LACNIC, in partnership with IDB Lab under the LACChain program, an initiative led by IDB Lab established in 2019 to accelerate the development of the blockchain ecosystem in Latin America and the Caribbean. To learn more about LACNET,
visit https://lacnet.lacchain.net/lacnet-eng/.

About BNDES

The Brazilian Development Bank (BNDES) is Brazil's main financing agent for development. Since its foundation in 1952, the BNDES has played a fundamental role in stimulating the expansion of industry and infrastructure in the country. Throughout the Bank's history, its operations have evolved according to the Brazilian socio-economic challenges. Now, they include support for exports, technological innovation, sustainable socio-environmental development, and

the modernization of public administration. To learn more about BNDES, visit https://www.bndes.gov.br/wps/portal/site/home.

About RBB

Rede Blockchain Brasil (RBB) is a public-permissioned blockchain network focused on government applications and the broader public interest. It is a joint initiative led by the Brazilian Development Bank (BNDES) and the Brazilian Federal Court of Accounts (TCU), in collaboration with more than a dozen public and private institutions in Brazil.