

Empowering 3.6 Million Citizens with Blockchain-Enabled Digital Identity in Buenos Aires

Overview

In October 2024, the Government of Buenos Aires introduced QuarkID, a decentralized digital identity system designed to reshape how citizens manage and access their personal information. Co-created with blockchain experts across Latin America, QuarkID is an open-source solution that consolidates government-issued and private credentials into one secure platform.

It is recognized as a digital public good by the United Nations, aligned with the Sustainable Development Goals, specifically related to the protection of human rights, and empowers individuals with control over their data while advancing global standards for privacy and inclusion.

With zero-knowledge cryptography ensuring privacy, users have a seamless, secure, and decentralized way to engage with both public and private institutions. The Government of Buenos Aires is pioneering this system as a scalable solution, with plans to expand its impact across Latin America and beyond.

Challenge

For years, identity management systems worldwide have struggled with significant inefficiencies and security vulnerabilities affecting citizens and government institutions. Obtaining official documents often involves long waits and physical trips to government offices, creating inconvenience and delays. Citizens frequently need notarized documents or approvals from various departments, making even simple transactions complex and cumbersome.

Centralized databases pose risks of unauthorized access and identity theft, leaving sensitive citizen data exposed. The lack of digital identity also means that citizens have limited control over how their information is used. Routine transactions—like renting a car or accessing healthcare services—disclose more data than necessary and governments often store records of the interactions.

These analog processes are resource-intensive and costly for governments around the world, including Buenos Aires, as the city works to bridge the gap between digital and paper-based systems. To address these challenges, the Government of Buenos Aires needed a solution that could streamline access, enhance security, and prioritize citizen sovereignty over their personal information.

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Opportunity

QuarkID emerged as the solution to these challenges, leveraging blockchain technology to create a secure and scalable digital identity system. Unlike traditional digital identity methods, QuarkID decentralizes control, storing credentials directly on users' devices and securing them with biometric encryption. This empowers citizens to use their digital identities for a range of interactions while ensuring privacy. For instance, when proving age, only the necessary information—confirmation of being over 18—is shared, with no additional data revealed.

QuarkID integrates with the **miBA app**, the official platform for Buenos Aires citizens to access government services and credentials. This integration ensures ease of use for citizens as miBA serves as a one-stop shop for accessing over 60 types of credentials, including birth, marriage, and death certificates; driver's licenses; vaccination records; and tax forms. The platform's seamless login functionality eliminates the need for passwords, allowing users to log in with a simple QR code.

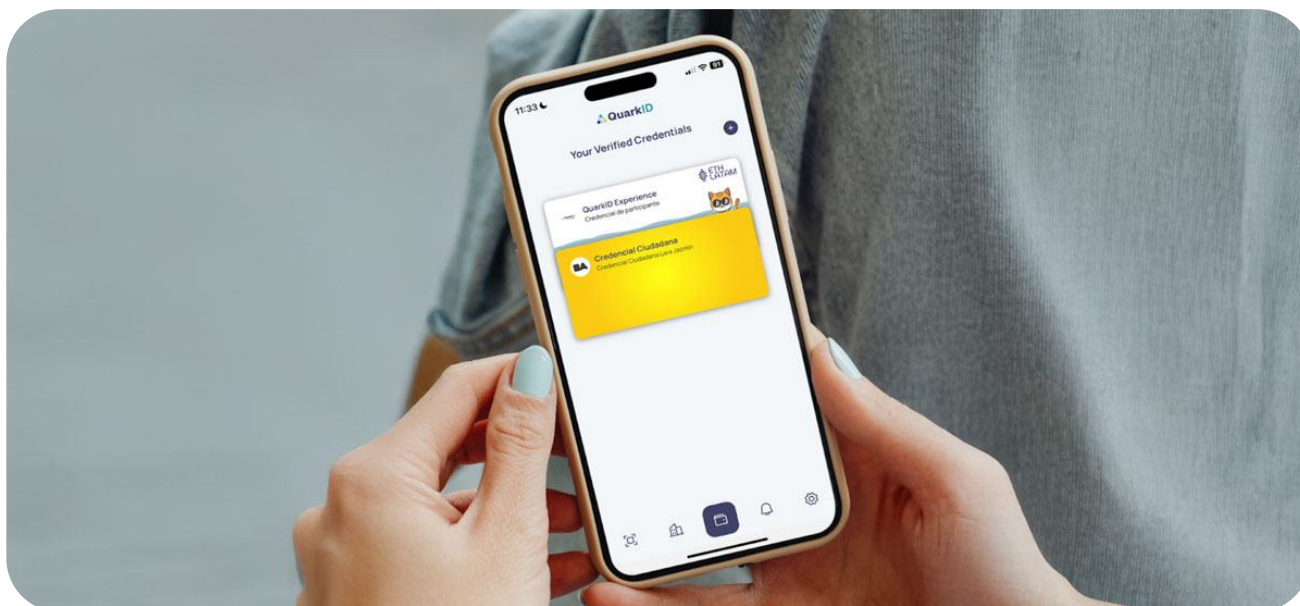
The choice to build QuarkID on ZKsync reflects the government's commitment to cutting-edge technology. ZKsync's zero-knowledge proofs allow verification of information without exposing unnecessary details, preserving privacy at every step. Its scalability and low transaction costs—batching up to 1,000 transactions into a single <\$0.01 transaction—make it an economically viable solution for large-scale adoption. Compliance with the W3C standard ensures QuarkID's interoperability with systems worldwide and positions Buenos Aires as a leader in global identity innovation.



“We’ve seen a lot of blockchain-based innovation in financial services, but this initiative demonstrates the power of blockchain to revolutionize other uses cases such as government services by empowering citizens to safely and securely own their data. By giving residents control over their identities, we’re not only improving privacy and security, but we’re also setting the foundation for a future where personal data ownership is a basic right, protected by advanced zero-knowledge-based cryptographic proofs.”

Diego Fernandez

Former Secretary of Innovation and Digital Transformation of the City of Buenos Aires



Check the Demo: [Click the link](#)

Adoption and Impact

Since its launch, QuarkID has redefined how citizens interact with government services. In its first month, over 230,000 citizens accessed their decentralized digital identities, representing more than 6% of the eligible population.

QuarkID offers citizens a streamlined and secure way to access credentials while driving efficiency across government operations by optimizing processes, reducing reliance on manual tasks, and minimizing infrastructure consumption. This contributes to cost reductions, lower carbon footprints, and improved sustainability.

For example, by integrating this ecosystem, a single government department with 200 inspectors has saved approximately \$5,000 on fiscal credentials alone. QuarkID also reduces the time government teams spend on manual processes and enables citizens to avoid navigating multiple offices or enduring long wait times. Instead, credentials can now be securely managed and shared directly from the comfort of their homes, significantly improving accessibility and convenience.

The integration of QuarkID has also strengthened the Government of Buenos Aires' position as a global innovator. As the first city in the world to incorporate blockchain into its identity systems, Buenos Aires has created an open-source framework that other governments can adapt to meet their own needs. By providing both public and private organizations with a trusted, interoperable framework, QuarkID has opened the door for the broader adoption of decentralized digital identity solutions.



"The incorporation of zero-knowledge blockchain technology into the City's digital identity system is an unprecedented milestone that positions us globally as a leader and once again demonstrates that the City of Buenos Aires is at the forefront of innovation. Adopting new technologies that simplify citizens' processes while giving them full control over their information is a fundamental step toward continuing to offer more secure and transparent digital solutions."

Jorge Macri

Chief of Government of the City of Buenos Aires

Notable Stats

◆ Eligible citizens

3.6 million residents of Buenos Aires.

◆ Cost of minting DIDs

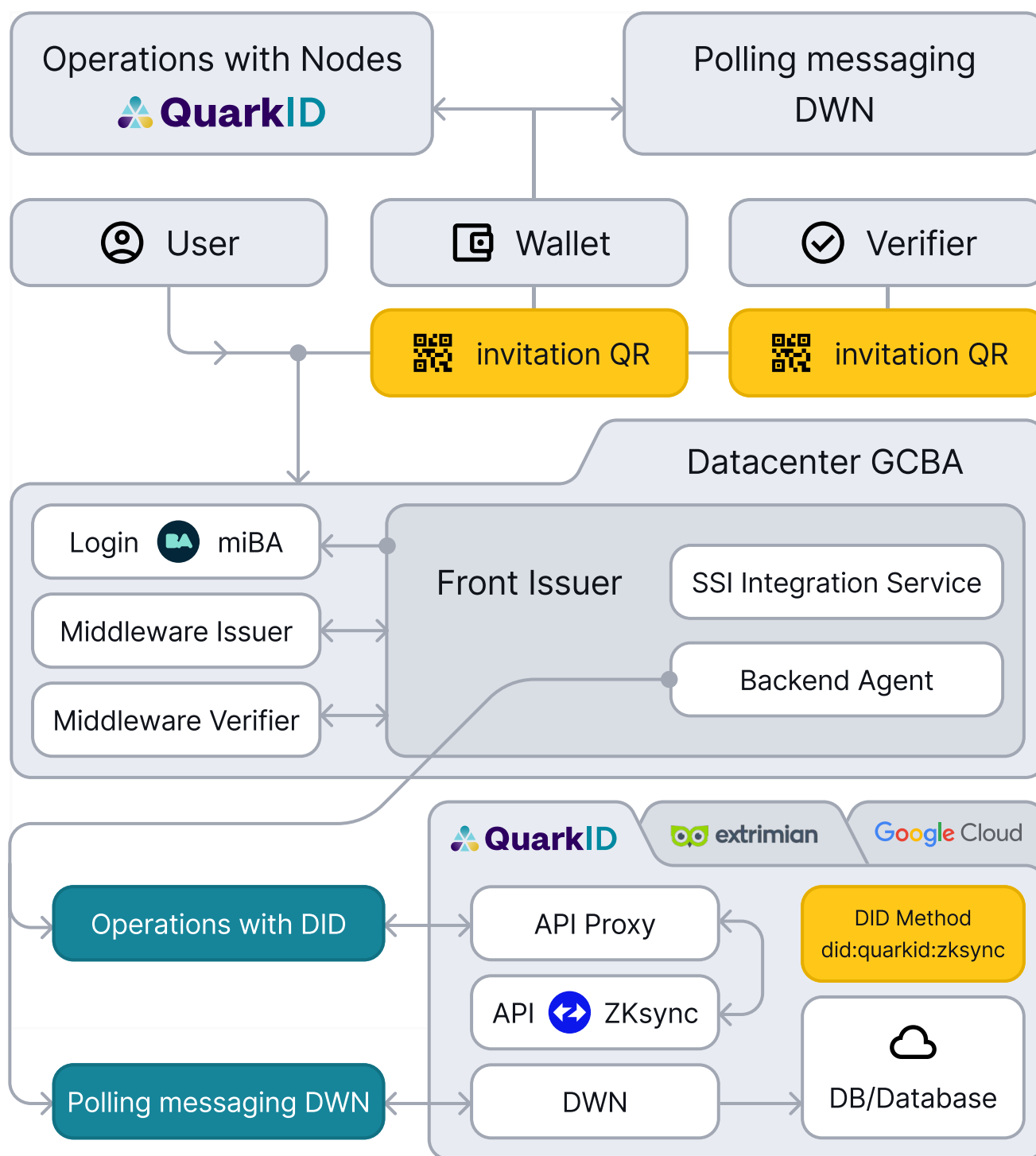
\$0.0001 USD per decentralized identity.

◆ Adoption

Over 230,000 users accessed credentials in the first month (>6% of eligible citizens).

◆ Transactions

Up to 1,000 credentials can be batched into a single <\$0.01 transaction.



Technical Snapshot

QuarkID's system uses Decentralized Identifiers (DIDs), anchored on ZKsync, to enable citizens to securely manage and share their credentials.

ZKsync's zero-knowledge proofs allow users to verify information without revealing personal details. This ensures that no Personally Identifiable Information (PII) is stored on-chain, with all sensitive data encrypted on users' devices. The system adheres to the W3C standard, ensuring interoperability with global frameworks and scalability for future use cases.

By leveraging ZKsync's high transaction throughput and low costs, QuarkID supports millions of users while maintaining economic feasibility for the government. This combination of technical strength and cost efficiency positions QuarkID as a model for blockchain-based identity solutions worldwide.

Why ZKsync?

The Government of Buenos Aires chose ZKsync for QuarkID because of its ability to meet the city's needs for privacy, scalability, and efficiency. ZKsync's technology combines advanced security with practical functionality, making it an ideal fit for decentralized identity systems.

- Zero-knowledge proofs**
 ZKsync allows users to verify credentials securely without revealing sensitive data.
- Scalability and low costs**
 ZKsync batches thousands of transactions into a single proof, reducing costs to <\$0.01 per transaction.

- Ethereum compatibility**
 ZKsync's seamless integration with Ethereum ensures interoperability for future expansions.
- Security and reliability**
 Operating as a Layer 2 solution, ZKsync inherits Ethereum's robust security features, safeguarding credentials against tampering or unauthorized access.

By building QuarkID on ZKsync, Buenos Aires has created a secure, scalable solution that addresses local needs while inspiring global adoption.