

Blockchain-based Land Registration System



PROJECT OVERVIEW

Blockchain is making waves in the real estate sector with the level of transparency it provides. The technology is being increasingly considered for use in land registration with its ability to immutably record and share information.

The immutable, decentralized nature of the blockchain network renders data transparent for any untrusted party to verify. With self-executable smart contracts, trust is enhanced between parties and outcomes are validated by everyone in the network. Traditional land transaction records can now be replaced by a distributed ledger protected by cryptography and consensus technology.

CLIENT PROFILE

The client is a statutory board set up by the Government of a South Asian nation to optimize land usage for economic and social development. They play a regulatory role as the national land registration authority, managing land sales, leases, and allocations.

BUSINESS CHALLENGES

Flawed or incomplete paperwork, forgery, and foreclosure defects continue to be a problem for property/mortgage holders who have to overcome legal and regulatory hurdles to legitimize their ownership. Mismanagement and lack of a foolproof system to authenticate land deals and ownership had emerged as a major administrative challenge for the land registrar.

BUSINESS REQUIREMENT

The client explored the possibility of a blockchain solution for land registry that offered inherent benefits to meet their requirements.

- ❖ Ensure authenticity of information related to real estate transactions
- ❖ Provide a faster, safer, cheaper means of executing property transactions
- ❖ Prevent tampering or forging of records linked to the system

By making real estate transactions searchable, several issues surrounding legal ownership of a property could be remedied.

QBURST SOLUTION

QBurst embarked on the Ethereum blockchain programming journey using Solidity framework to code smart contracts, which ensure necessary approvals are obtained from government authorities. We developed a ReactJS-based web application with a blockchain explorer for users to view transactions within the application. We also relayed transactions on the public Ethereum blockchain network (Etherscan) so that anyone can verify and validate records.

A custom application was developed to manage customer identities. This enabled interaction with the Ethereum network using email addresses or usernames. The application acts like a wallet for users, enabling them to sign blockchain transactions.

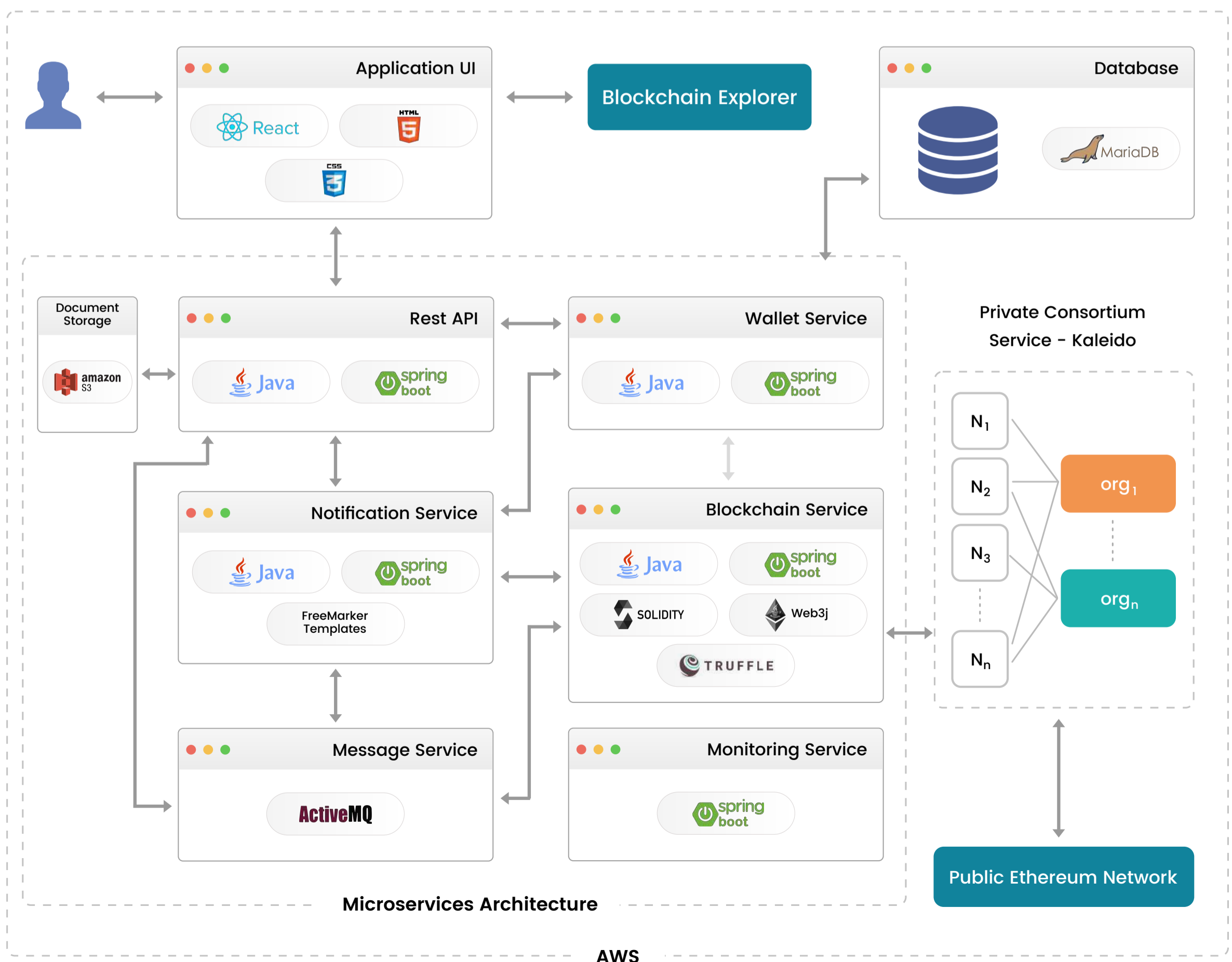
The solution creates an immutable history of transactional records that are permanently linked to the system. Near real-time traceability and transparency are achieved as each transaction is captured and recorded at every stage of the process.

"QBurst helped us implement a Blockchain network that ensures security and transparency in land registrations. This streamlined the land transaction process and minimized ownership disputes."
Director, National Land Registry

HIGHLIGHTS

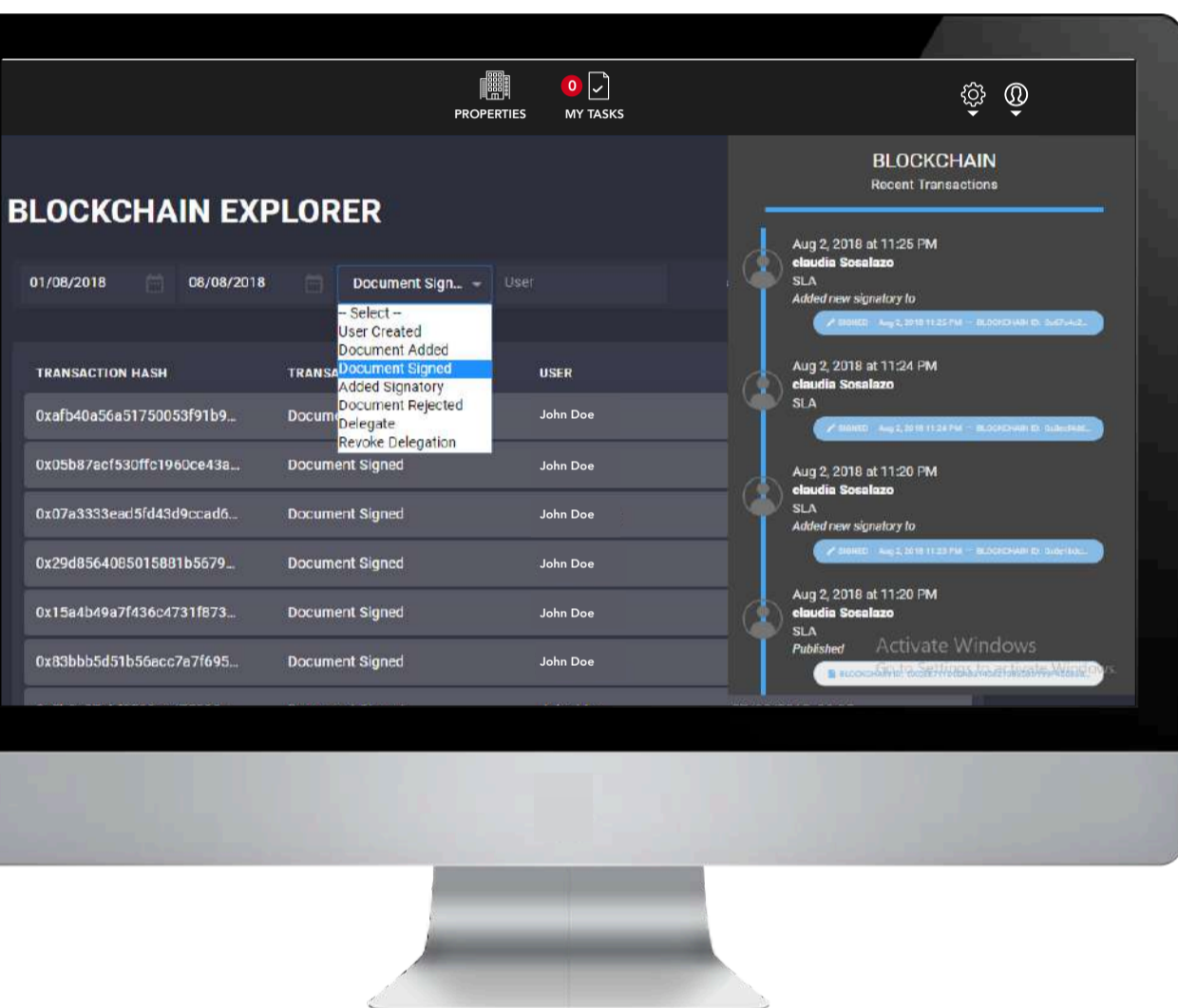
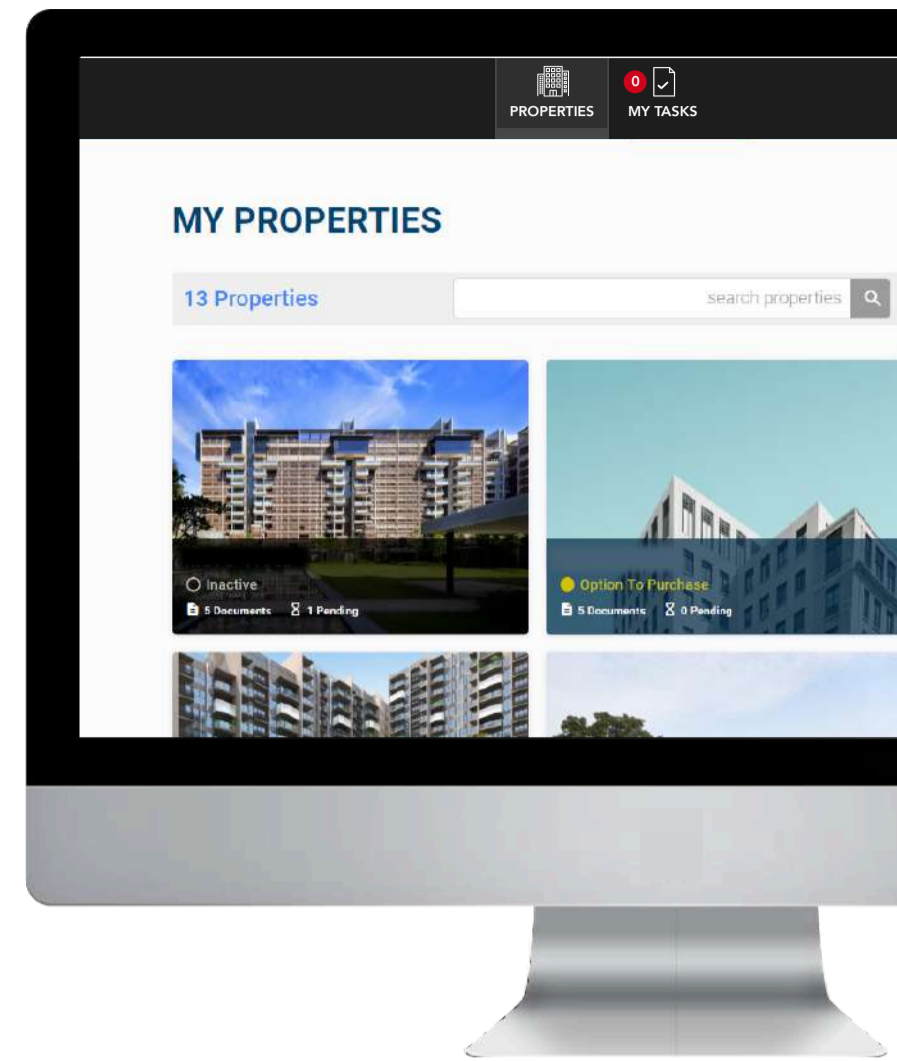
- Microservices architecture was used to encapsulate the logic and data persistence of all elements of the application; microservices were built using Spring Boot.
- Truffle was used to migrate the contracts to Ethereum network and execute logic.
- Web3j API for Java was used to connect the Spring Boot-based Java microservices with the Ethereum blockchain.
- Payment integration was implemented along with option to avail loans from financial institutions.
- Blockchain nodes set up and run on a private consortium on Kaleido, a service offering on blockchain, to ensure security of participants.

TECHNOLOGY STACK



BUSINESS BENEFITS

- ❖ Near real-time visibility into status of property and sale deed with access to complete and permanent transaction history
- ❖ Average time taken to process land transactions reduced by half
- ❖ 33% reduction in administrative costs by eliminating manual processes
- ❖ Eliminated the need to store physical archives of land records
- ❖ 24% increase in land investments
- ❖ Enhanced data security and authenticity of land records renewed confidence of buyers in the land registry system



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