

Transforming the patient's financial experience

Evolving the healthcare revenue cycle, increasing transparency and improving patient trust with blockchain

Case study



Challenge

Greater financial transparency and streamlined processes

Healthcare's revenue cycle becomes especially complex where factors like legacy systems, increased patient financial responsibility, more complicated payer contracts and greater regulatory demands, intersect. The ill-fitting combination simply creates greater expense, waste, risk and inefficiencies. Our client works with providers, patients and administrators to modernize and clarify the financial aspects of the healthcare experience. Their focus is on maximizing hospital profitability through increasing net patient revenue and service volumes. They also want to enable providers to concentrate on their patients instead of endless administration.

A recent [time and motion study](#) revealed that US doctors spend only 27% of their office day on direct clinical face-time with patients, and a massive 49% of their time dealing with electronic health records (EHRs) and other desk work.

Finance-wise, healthcare organizations are incredibly complex. Constrained (compared to other industries) by legacy systems and processes, plus ancient infrastructure and interoperability, administrative costs are largely hidden from physicians, administrators and patients.

Countless transactions make up the healthcare revenue cycle, including scheduling visits, checking insurance eligibility, claiming and billing. Many of these essential tasks are completed manually and governed by human fallibility. And to fix these inefficiencies and complexities, providers need to review their approach to revenue-cycle management.

Our challenge was to:

- **Speed up** payment settlements
- **Minimize** manual tasks, increasing efficiency for all
- **Guarantee** a traceable approval history
- **Provide** more consistency by defining business processes more clearly
- **Transform** complex and opaque revenue-cycle processes

In other words, to create a series of end-to-end revenue-cycle modules that could be accessed by multiple payers and providers within a consortium.



Delivering automated efficiency

Luxoft's goals were to build a reference architecture for the platform as well as developing new modules to streamline processes and simplify authorization. We built our solution on the core of distributed ledgers (DLT) to enable trustworthy smart contracts. Also, we leveraged data science to extract knowledge and insight, increasing efficiency and implementing an intelligent revenue cycle.

By transforming the patient financial experience, we delivered a revenue-cycle solution with lasting impact and value to healthcare systems. The key feature — frictionless and automated preauthorization interaction — makes an important contribution to increasing transparency and improving patient trust.

The system also includes the following features:

- Automatic preauthorization process
- Messenger platform between Provider and Payer
- Patient and supplier non-paying blacklist logic
- Architecture allows Payer preauthorization via "Oracles"
- Seamless integration with EPIC system
- System dashboards and statistics

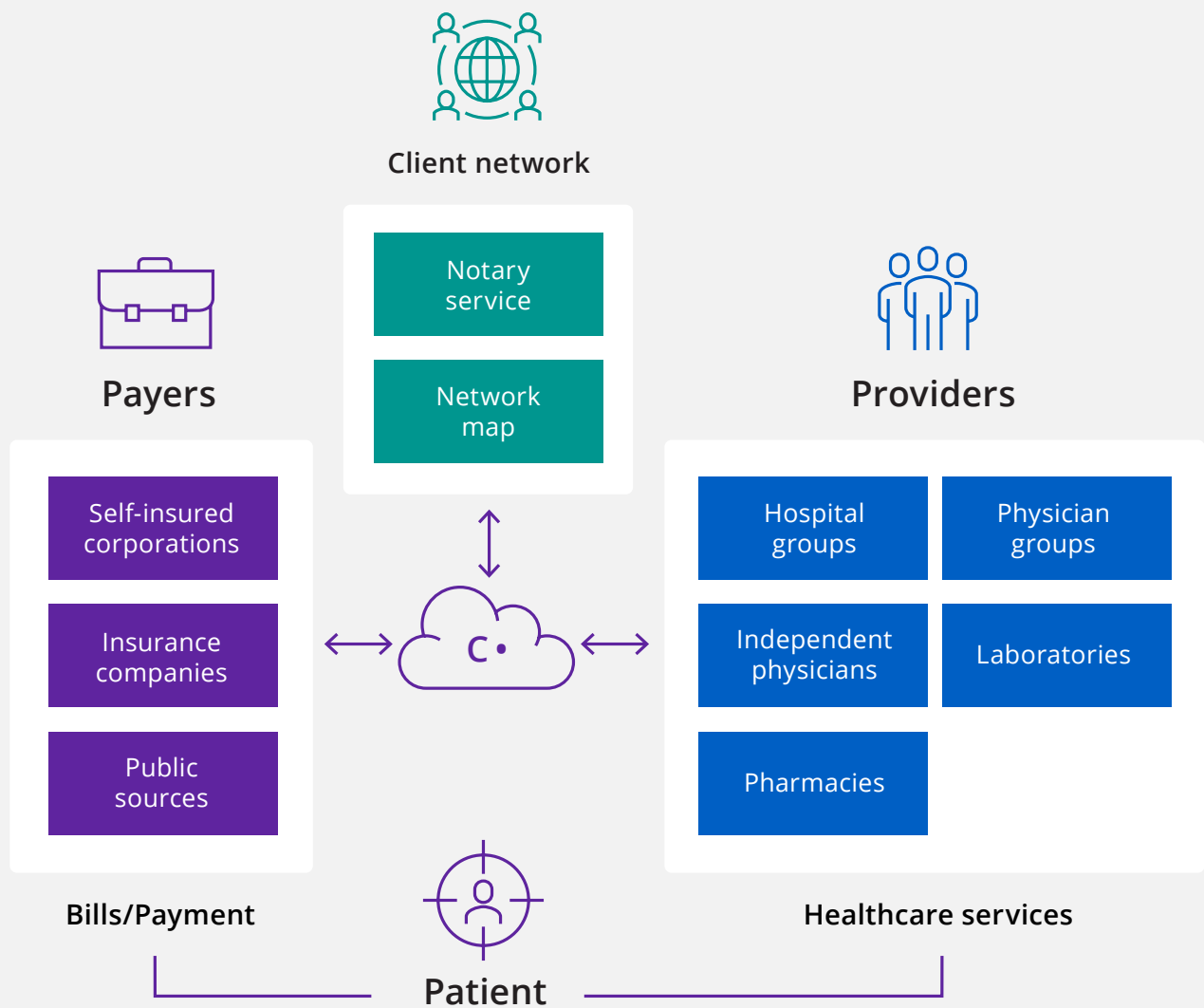
Blockchain to the rescue

Collaborative care requires extremely sensitive information — personal, clinical and financial — to be distributed on a strictly need-to-know basis. Blockchain security, transparency, privacy and efficiency are built into the solution, allowing patients, doctors, hospitals and suppliers to share data with each other through consensus algorithms.

Using permissioned blockchain guarantees that important medical data are safe and secure by embedding the agreed-upon rules of preauthorization into the smart contracts. In turn, these smart contracts increase trust and decrease the likelihood of fraud by patients. Blockchain provides the integrity, tracking and accountability needed to dispel any fears around sharing personal data.

Automated contracts improve accuracy and avoid the need for manual validation, which reduces overheads.





Corda network consists of several nodes:

- **Provider node** — hosted clinic-side
- **Payer node** — hosted insurance-company-side
- **Notary node** — hosted client-side: Ensures all transactions in the system are unique
- **Observer node** — hosted client-side: Where all historical data from other nodes are stored
- **Oracle node** — hosted client-side: Allows insurance companies to delegate to it before the authorization process

When a doctor creates a referral for the patient, clinic-side, the Provider node starts the business flow and initiates connection with the Oracle and Payer to confirm whether Payer referral preauthorization was granted. Once negotiations are completed, the transaction is digitally signed by all parties, notarized at the Notary level and sent to the Observatory for storage. Until that time, data are securely and immutably stored on distributed ledgers.



Results

Clearer, more trustworthy experiences

In just 6 months, Luxoft translated the client's vision into a desirable and commercially viable concept, tested and validated by providers, payers and patients.

The single source of truth afforded by DLT allows patients, doctors and hospitals to make more proactive and better-informed decisions. We transform the patient financial experience and deliver a revenue-cycle solution with lasting impact and value to healthcare systems by: content creation, and cross-functional team collaboration tools that could be implemented globally, delivering technology innovation.

- **Streamlining revenue-cycle processes.** Smart contracts allow visible and immediate changes
- **Improving privacy.** Transactional data is strictly confidential and shared with authorized parties only
- **Increasing efficiency.** The system can process many patients, simultaneously, handling an estimated 100,000 transactions a year
- **Inspiring trust.** By creating a P2P connection in an untrusted environment
- **Cutting costs.** Automated contracts increase accuracy and avoid the need for manual validation
- **Being scalable.** The solution can accommodate an unlimited number of partners
- **Being customizable.** The solution can be easily tailored to integrate with different healthcare management systems

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About Luxoft

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