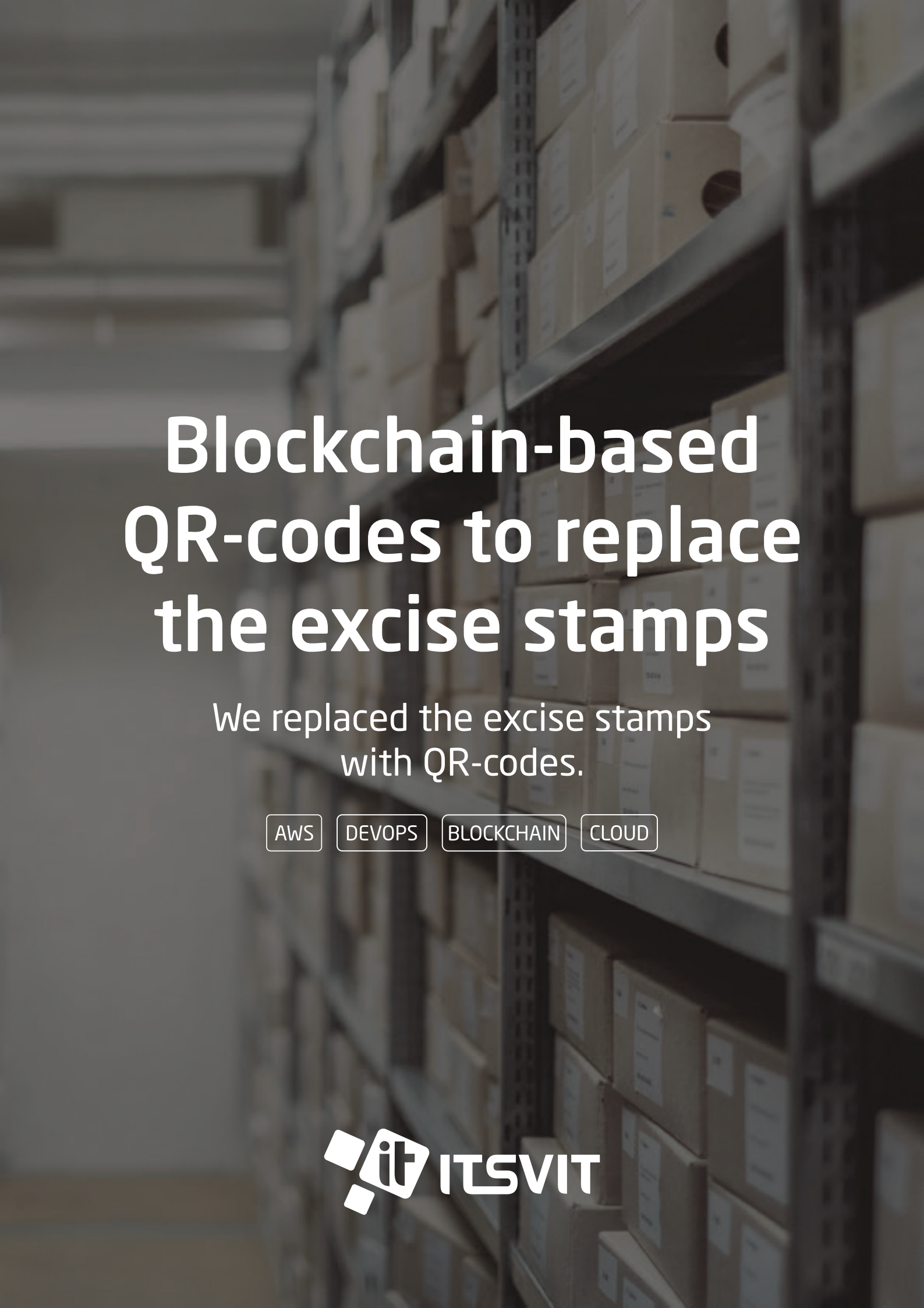


Blockchain-based QR-codes to replace the excise stamps

We replaced the excise stamps with QR-codes.

AWS DEVOPS BLOCKCHAIN CLOUD

ITSVIT

Case Info

Location: Ukraine

Industry: Logistics company

Partnership period: September-October 2017

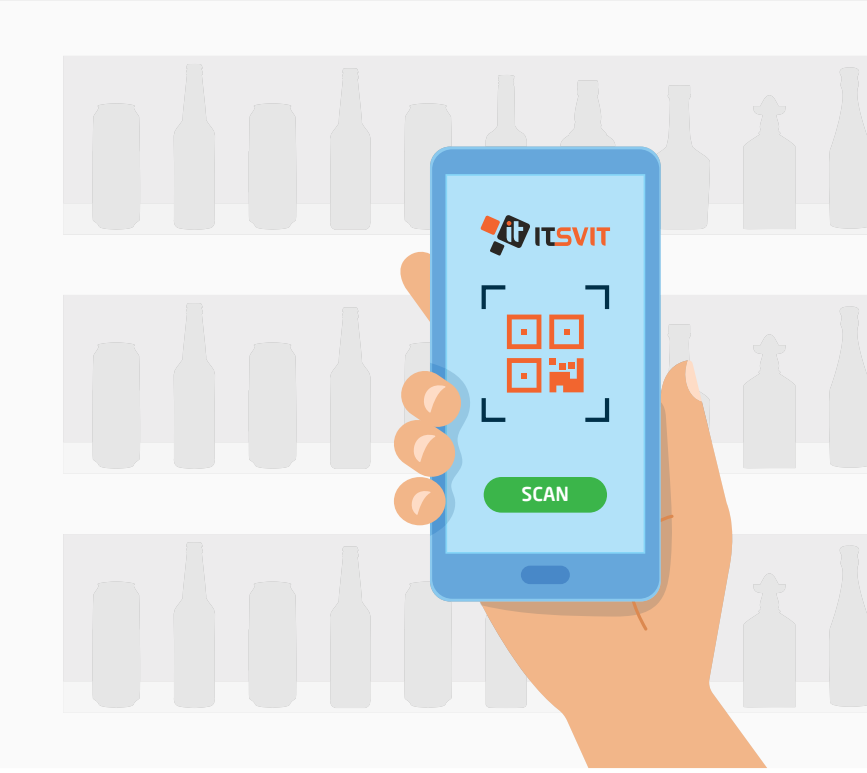
Team size: 2 - 4 people

Team location: Kharkiv, Ukraine

Services: Blockchain development, Cloud architecture, Web development

Expertise delivered: AWS cloud administration, DevOps services, Blockchain development, Cloud infrastructure management

Technology stack: Ethereum API, Laravel, Node.js



Client's goals

The goal of the project was to use the blockchain technology to replace the excise stamps with QR-codes. This would provide immense benefits:

Reduce the risk of fraud and counterfeit **to 0**

Reduce the spending on creating the excise stamps by approx **90%**

Increase the tax revenues by nearly **100%**

In addition, the system would ensure such advantages:

- **Transparency** — due to the blockchain architecture, the system is able to highlight the status of each item, whether it is "packaged", "delivered" or "sold"
- **Immutability** — the open ledger ensures the records cannot be altered and the destination of each item can be tracked
- **Legitimity** — the codes cannot be forged, as scanning a forged code will reveal the fact of counterfeit at once
- **Feasibility** — replacing the expensive (and forgeable) excise stamps with inexpensive (yet unforgeable) QR-codes would ensure both cutting the stamp production costs and increasing the tax revenues from the distribution of excise goods

For example, the percentage of counterfeit alcohol sales can reach up to **55%** of the country's official statistics (about **$450 million a year** in the case of Ukraine).

Project requirements

The QR-code should be used the same way an excise stamp is used nowadays, just without the possibility to forge it. It should be issued by the governing body and store the date and location of producing each unit of excise goods. As, an example, the QR-codes for cigarettes would look like this:

- The code on the pack contains the details of the production location, date and batch number
- The code on the block contains the hashes of all the pack QR-codes within
- The code on the box contains the hashes of all the block QR-codes within
- The code on the pallet contains the hashes of all the box QR-codes within
- The code on the batch contains the hashes of all the pallet QR-codes in it

Project results

The system works as follows:

1. The regulator prints the QR-codes
2. The manufacturer marks the goods with QR-codes and packs them
3. The tokens are put into “packaged” state
4. Once the wholesale distributor splits the batch, the tokens are updated and the pallet codes are activated
5. The same process goes all the way down to a single pack of cigarettes
6. The customers can scan the item QR-codes to ensure their validity
7. Once the item is sold, its token is put to “sold” state, closing the block

Due to the immutability of blockchain ledger, **the counterfeit goods are identified** at once during scanning. All the textual details are stored in the cloud, only the transaction hashes are stored in the ledger. **The scanning takes milliseconds and the data uses literally no disk space**.

Challenges resolved

IT Svit team has a wide experience in developing blockchain-based solutions for multiple industries. We leveraged this knowledge to accomplish all the tasks of the project:

- Using **Ethereum smart contracts** allowed us to deliver a flexible and highly configurable platform that can interact with multiple third-party software modules through API
- All the textual details are stored in the **MongoDB in the cloud**, and only the transaction hashes are stored within the blocks. This leads to minimal usage of system resources and allows the transactions and checks to happen in milliseconds
- We delivered both a web portal and a **lightweight blockchain wallet** for checking the **QR-code status** through a mobile device

> **This system allows replacing the excise stamps with QR-codes to cut the expenses on producing said stamps, while improving the level of security and the ease of tracking the goods. It can serve as one of the pillars of e-Government, helping to increase the tax revenues and remove the possibility of excise stamp forgery or selling counterfeit goods.**
>
> Vladimir Fedak, CEO at IT Svit

About Us

BIG DATA

DEVOPS

MACHINE LEARNING

WEB DEV

BLOCKCHAIN

STARTUPS

For more than **12** years IT Svit helps the companies worldwide innovate and overcome their challenges. We have completed more than **600** projects, delivered successful projects for **6** Fortune 500 companies, helped **16** startups secure the investment and develop awesome MVPs. Our team of **50+** specialists provides services that earn **4.9** out of 5 customer satisfaction on Clutch.co.

IT Svit specializes in DevOps services, Big Data technology, Machine Learning, bespoke Blockchain platforms, full-cycle services for startups, web development and QA.

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