

Background and context

As the central bank and financial market supervisory authority of the Republic of Lithuania, the Bank of Lithuania is primarily responsible for the regulation and supervision of market participants in accordance with applicable legal acts and requirements. At the same time, in cooperation with the Parliament, Invest Lithuania, the Ministry of Finance and the Ministry the Economy and Innovation the Bank of Lithuania seeks to contribute to the development of new growth opportunities for FinTech market participants through the development of balanced and attractive regulation promoting financial innovations.

Consequently, as part of its 2017-2020 strategic direction, the Bank of Lithuania aims to create and maintain a supportive environment, stimulating competitiveness and innovations in the field of finance.

To promote innovation, its development and subsequent implementation, Bank of Lithuania has envisioned a *permitted technological blockchain sandbox* – **LBChain** – allowing permitted FinTechs to test their use cases while receiving regulatory assistance and technology support.

With LBChain the Bank of Lithuania seeks to:

- Create conditions for FinTechs to acquire knowhow and conduct applied research
- Facilitate the validation of experimental applications and solutions
- Enable the exploration of development trends of disruptive technologies
- Stimulate the demand for innovations and introduction of new products to the market
- Improve the competitiveness of Lithuania and attract FDI

About the project

LBChain is a **blockchain-based technological sandbox** which combines regulatory and technological infrastructures and allows FinTech companies to test their business solutions in a controlled environment. The platform will enable Lithuanian and international start-ups as well as financial and FinTech companies to gain new knowledge, carry out blockchain-oriented research, test and adapt blockchain-based services and offer state-of-the-art innovations to their customers. The blockchain technology has particularly great adaptation possibilities in those areas where high data transmission security and credibility is required, e.g. financial operations or electronic voting. LBChain will function as a service-based platform for cooperating with private actors both nationally and internationally.

Usually fintechs and startups have bold and innovative ideas. However, they lack general knowledge and experience when it comes to the financial ecosystem, legal issues and regulation. They also generally do not have the opportunity to test their products in a safe and innovation-conducive environment. LBChain offers both: consultations by the Bank of Lithuania on regulation as well as technical and technological assistance by leading blockchain integrators.

This platform will contribute to the creation of better conditions in Lithuania for the development of the FinTech business and innovation-friendly regulation, as well as help the Bank of Lithuania keep pace with technology innovations that change financial institution activities.

LBChain is the world's first-of-its kind platform developed by a financial market regulator (the Bank of Lithuania).

The platform is expected to be launched in Q3 2020.

The project is funded by the European Regional Development Fund.

Central goal

Accelerate the development and application of blockchain-based solutions in the financial sector and improve the quality of regulation in the financial sector.

Stages of the project

The LBChain project consists of three stages: *concept development*, *prototype development* and *pilot production*.

At the end of each stage the tenderers compete and their number will be reduced after each stage in order to select those tenders whose tender mostly corresponds to the “Technical Specification of the pre-commercial procurement”.

Participant selection criteria:

1. Level of innovation
2. Market potential
3. Level of readiness

The overall objective of the LBChain project stage I-III is to concept, develop and test the LBChain platform-service.

Stage I

Concept development (selection of eligible participants, LBChain concept creation)

The objective for stage I is to develop and confirm the concept of the LBChain platform-service, detailing the technological solution and other aspects in terms of feasibility.

To create this platform, the Bank of Lithuania invoked service providers selected through a pre-commercial procurement. Out of nine companies that expressed their interest, the Bank of Lithuania selected four:

1. UAB Deloitte verslo konsultacijos
2. IBM Polska Sp. z.o.o.
3. UAB Tieto Lietuva
4. UAB INNTEC

During the first stage, the service providers identified the market needs and submitted their LBChain concepts.

After the first stage, the Bank of Lithuania has selected three:

1. UAB Deloitte verslo konsultacijos
2. IBM Polska Sp. z.o.o.
3. UAB Tieto Lietuva

Companies (platform supplier) that were not selected for the second stage of the project were able to join the *LBChain focus group*. They were also able to register to the third stage (as tester of platform), where FinTech companies created and tested their products within the LBChain environment.

Stage II

Prototype development (development and testing of LBChain platform prototypes)

The main objective - to develop a prototype of the LBChain platform and test it with FinTech companies.

Three service providers selected during the first stage offered their LBChain technological solutions: IBM Polska Sp. z.o.o., UAB Tieto Lietuva and UAB Deloitte verslo konsultacijos in collaboration with Deloitte EMEA Blockchain Lab.

During the second stage, they were working on two tasks. *First*, they joined forces with the selected FinTech companies to create the LBChain platform. They were joined by 6 (out of 21) FinTech companies:

1. Astronautika, UAB (operating under the brand name Businero)
2. Ondato, UAB
3. UAB Seven Seas Europe
4. UAB Sistemų integracijos sprendimai (Lithuania)
5. Sofitto NV (Belgium)
6. FA Solutions Oy (Finland)

Stage II

Each service provider worked with 2 FinTech companies:

1. Deloitte, together with Ondato, UAB, was testing a KYC solution for anti-money laundering and with Seven Seas Europe – a cross-border payment solution.
2. IBM collaborated with Businero, which was creating a crowdfunding platform, and with UAB Sistemų integracijos sprendimai, which was testing smartcontract for factoring process management.
3. In the technological platform offered by Tieto, Sofitto tested a payment token, mobile POS and payment card solutions, and FA Solutions – an unlisted shares trading platform.

Second, together with the Bank of Lithuania, they consulted the FinTech companies on developing a specific blockchain-based product that would meet their needs. The FinTech companies then were able to test this product within the LBChain environment.

To assess the adaptability, possibilities and reliability of the developed LBChain platforms, FinTech companies were testing innovative and entirely different products. This is useful to both companies and developers as it allows to better assess advantages and disadvantages of the proposed solutions.

Examples of tested solutions:

1. KYC solution for AML compliance
2. Cross-border payments
3. Smart contract for factoring
4. Mobile POS and payment card solution
5. Unlisted share trading platform
6. Crowdfunding platform
7. Payment token

LBChain platform prototypes and FinTech companies' products were presented in September. Two out of three platform suppliers for the LBChain platform service were selected to move to the next stage. This marked the end of the second stage.

In the stage III new FinTechs will be selected.

Stage III

Pilot production (final testing and launch of the LBChain platform)

The Bank of Lithuania has chosen IBM Polska Sp. z.o.o. and Tieto Lietuva, UAB to proceed to the next stage of its endeavour to create LBChain, a blockchain-based technological platform. Also 8 FinTech companies participate (4 FinTechs per company). Companies will continue to develop LBChain and improve a prototype, while FinTech companies will create their solutions there. The winner of the project will be revealed after the final testing session.

The final testing session will show which solution is most suitable for market needs. The greatest advantage of LBChain is its versatility. We strive to create a platform that would not only serve for testing products or services that are already offered on the market, but would also be used to create those that might currently exist only in a financial architect's mind.

Participants of the unique project run by the Bank of Lithuania will present three blockchain platform prototypes where six FinTech companies from three different countries have already tested their products, thus contributing to their improvement.

Start-ups and FinTech companies developing blockchain-based financial products will be provided with the possibility to test them in the LBChain platform which will now become wide open to market participants.

LBChain technology platform high level architecture

LBChain platform-service is made from two technology parts. First part – web application (regulatory/technology support, user management, communication and other layers). Second part – Blockchain platform (cloud based Blockchain-as-a-Service).

From the market research we found that for Banks, Regulators, Insurance Companies or Capital Market Participants the network partners identification and KYC/AML procedures for customers is essential and rated higher than assumptions of public blockchain protocols of nodes anonymization, decentralization and distribution across geography. Furthermore, permissioned blockchain network can assure much higher transaction per second output in most of cases.

From our findings Enterprise Kubernetes Edition combined with Blockchain-as-a-Service (BaaS) is the most suitable model for LBChain Blockchain Platform. These ensure possibility to develop solution based on any blockchain framework which architecture allows containerization or make use of BaaS towards fast deployment and prototyping of solution if Fintech would rather like to focus on business layer of its solution.

Two permissioned blockchain/DLT platforms were identified as best suit for LBChain: Hyperledger Fabric and R3 Corda.

The blockchain platform architecture is made from three layers:

- Infrastructure layer – the area where underground infrastructure is created and managed (Kubernetes, Docker, Virtual machines management and etc.)
- Platforms layer – the area where blockchain platform is created and managed.
- Application Layer – the area where the business logic is implemented.

The architecture described above enables LBChain blockchain platform to support more than one test environment in the same time. It was tested with 6 different fintechs during second phase. During testing period blockchain platform for one fintech company was restarted (completely destroyed and created again with different platform parameters) and this did not affected other fintechs in any way.