CHAPTER 5

Blockchain

8) Uniper: Dealing with wholesale complexity as part of a digital strategy

Grigory Shevchenko, Uniper

Uniper is a leading international energy company that generates, trades, and markets energy on a large scale. Uniper also procures, stores, transports, and supplies commodities such as natural gas, LNG, and coal as well as energy-related products. It is a reliable partner for customers planning and implementing innovative, lower-carbon solutions on their decarbonization journey. Uniper is a hydrogen pioneer, is active worldwide along the entire hydrogen value chain, and is conducting projects to make hydrogen a mainstay of the energy supply. The company is based in Düsseldorf and is one of Germany's largest publicly listed energy supply companies.

Disruptive technologies may still be in an experimental stage but may hold the promise of providing substantial cost savings. In critical infrastructures, regulatory frameworks may hamper or delay establishing open platforms and marketplaces, but novel technologies such as Blockchain may circumvent these hurdles.

This case is an example of how to use disruptive digital technologies to tap into new market segments, moving from bulk trading volumes to a fragmented customer base without jeopardizing profitability.

Background: We are looking for a technology to simplify our processes and find it

Energy trading is a market space with a large set of transactions, both financial and physical, happening and requiring reliable mechanisms of interaction. It is only natural that Uniper has followed this technology since early days of its inception. For some time, however, the application benefits and possible

How to cite this book chapter:
Burger, C. and Weinmann, J. 2024. *Leveraging Digital Innovation: Lessons for Implementation.* Pp. 71–89. London: Ubiquity Press. DOI: https://doi.org/10.5334/bda.e.

use cases especially given possible implementation and transformation efforts were not yet fully obvious to us. But we began to think about Blockchain and tried to find out what this technology might have to offer to us being an energy midstreamer planning to simplify our processes. We looked at the possibility of introducing a federated Blockchain. However, in the end we decided to – at least initially – use a proprietary, permissioned Blockchain application, as it was easier to roll out and control due to the fact that only permissioned members have access. In addition, we considered it to be the more successful and safer playground, which we needed. Coordination with dozens of other stakeholders during the initial phase could become difficult.

The reason to use a technology such as Blockchain was to simplify commodity flow management in a market characterized by extensive manual and paper-based transactions and high processing costs. At the same time, small-scale liquefied natural gas (LNG) was supposed to be developed as a new business. However, both these markets were comparatively small and complex for a big energy player such as Uniper. Thus it became clear that scalability and simplification were key and we saw a use case for the new technology.

It was a step-by-step approach. We wanted to start with the proof of concept (PoC), then implement the small-scale LNG platform as a minimum viable product (MVP). Further down the timeline, we planned to roll it out and onboard other market participants with the defined roles and possibly as node owners. The overall belief was that without Blockchain, the business model would not fly due to high administrative costs, because the commodity batch sizes were very small compared with the operational steps needed to process each batch. That was the main thing everybody agreed on. In addition, it was clear that this business model would be a lot easier to find both internal and external acceptance if it were made scalable and efficient.

The onboarding of people is not easy

For the implementation process, we combined internal and external resources. That included us, Uniper IT, and Wipro as the external IT / Blockchain architect and consultant. The in-house IT expertise at Uniper was an advantage, so that all three partners were on the same page when working together. At the same time, we felt that our commercial acumen and understanding of markets and customer behavior in combination with Wipro's Blockchain expertise have a very high potential for an interesting and exciting design thinking case.

Since we have an established regular Trading IT innovation round in which people talk about innovation and discuss how IT can enhance business processes, the Blockchain project became part of this round. This turned into a design-thinking process and a number of workshops.

The initial implementation of Blockchain took 2–3 months, which was fast. The necessary adjustments took longer. Rolling out required the onboarding

of people, which was a challenge. It was done with the help of a workshop. The IT stages such as PoC, MVP, and so on had to be combined with the commercial ones, such as small-scale LNG supply negotiations, selection of transportation partners and of course end customer approach. The phase of testing, of user acceptance testing, of bug-fixing, of responding to change requests was next. It took a lot of persistence and communication to turn the Blockchain-bases small-scale LNG platform into a success.

Combining test user accounts with our IT system is a challenge

It took us just under two years from the first steps to the rollout. By now Blockchain has turned into a support function for Uniper; in our business niche, it has become a core process. Traditional LNG trading is well-scaled and overhead costs are in healthy relationship with the margin. You have one cargo with the equivalent of roughly one terawatt hour of gas. The trade can be concluded within 5 to 10 minutes (provided of course there is an existing framework contracts) To ensure acceptable profitability, though, you need a large portfolio of supply contracts, shipping assets and terminal positions, which carries risks and must be built over time.

Established gas trading businesses rely on streamlined processes and substantial trading volumes to add value. At the same time future growth is expected to come from smaller-scale, more complex products. There, decentralization, disintermediation, customer orientation, and flexible, small batches of molecules will be the future. Thus, we have to guarantee that the reconciliation effort, idle times and idle times for each transactions are minimized traceability, and immutability are ensured. For large commodity transactions the current state is efficient enough – one can very quickly agree upon a trade of e.g. one LNG

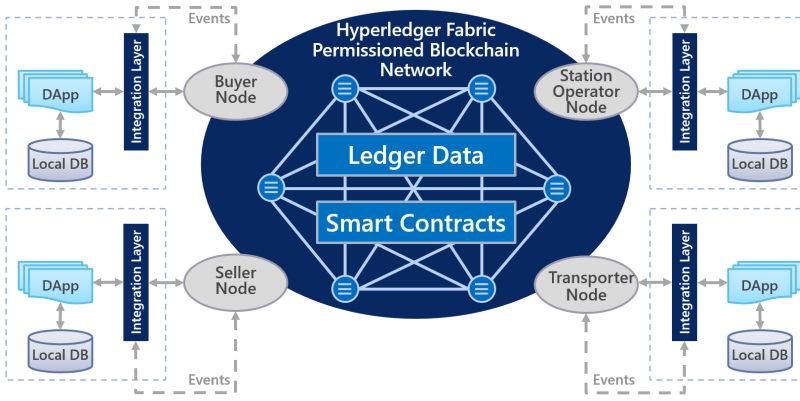

Figure 9: Small-scale LNG platform solution overview.
Source: Shevshenko (2022).

cargo carrying around one terawatt hour of gas. If we look at the delivery of one truckload of LNG, equivalent to roughly 30 megawatt hours, the effort is may not worth it. This has been one of the main considerations for Uniper's subsidiary Liqvis, which has been founded to develop the business of supplying LNG for LNG-fueled heavy-duty trucks via its network of fueling stations.

Entering the nascent market space involving many role interactions and manual transactions requires dealing with complexity early to ensure scalability and growth perspectives. You do not employ dozens of people on day one to track all the trucks, wait for fax messages and emails, compare the invoice with the bill of lading, and deal with customs / port authorities. At the same time, you need to establish commercial portfolio, which can be optimized to ensure that the most competitive source of commodity is tapped. In order to establish the flow of molecules from the source to the customer through efficient operation of the corresponding infrastructure assets, which is the ultimate mission of a midstreamer, we had to find a new way, and that is why we had a look at Blockchain as a supporting technology.

The platform addresses the existing pain points, impeding scalability and growth. It is supposed to transform the small-scale LNG flows into a proper market space, resulting in market efficiencies, easier optimization, significant cost savings for customers and stronger demand base for small-scale LNG terminals and producers. It is based on the distributed ledger that ensures all documentation and all information are on chain and interactions between value chain participants is done in an efficient way. The idea was that the external partners, such as terminal operators, transporters and eventually regulators or customs authorities become a defined access role and an option to host a node on their infrastructure should that become desired.

So far, we have introduced the MVP and talked about it with some of our external partners. We have given them a test user account and gathered and processed their feedback and. The challenge will be to have these request implemented. Such request range from interface requirements to and touchpoints with other systems.

It is better to deal with disruption before disruption deals with you

Our strategic target was to get the application to provide value and to enable a more efficient commodity flow. The first step was to build upon the value proposition of an energy midstreamer as such and to make it fit for a more decentralized fragmented commodity space. This meant developing new facets of the classical mission transforming large commodity positions into more complex flexible smaller customer products and thus earning an additional margin. We saw an opportunity for our company to test ways to expand traditional company strengths addressing global megatrends of digitalization, decentralization and decarbonization. The small-scale LNG platform has been concepted and

launched in a niche environment, nevertheless, it stood for disruption, which some people always consider to be threatening. However, the rationale was: Better to deal with disruption before disruption deals with you.

The organizational benefits included both the business model and the innovative edge that IT was able to represent internally. The same applied to our external IT partner, who was on the lookout for suitable Blockchain use case to showcase its capabilities.

Paving the way for us to create an attractive market space

Market response has so far been very positive. Market participants see the advantages of scalability and flexibility. The business potential is quite promising and we believe the small-scale LNG market growth can be capitalized upon and scaled.

Liqvis business is about marketing LNG as motor fuel through the fueling stations it builds. Procurement of commodity and its transportation is central for the profitability of the operations. At first, when the network is small, the optimization is quite straightforward – one negotiates the supply contract and starts the flows to several stations. Then the network grows and route and price optimizations become complex. If one starts sourcing in more places and plans to optimize the network of flows, it has to be done in a scalable way.

The platform implemented by Wipro enables demand and supply order placement with the corresponding documentation of loading and delivery of goods, the validation of the state of goods, and bill settlements. It further helps us to streamline trade by reducing turnaround time, effort, and inefficiencies. It creates scalability and brings visibility, transparency, and trust in all stages of LNG trade. Strategically, it paves the way for us to become the market maker for the low-carbon modern supply of alternative fuels and decentralized energy solutions.

In the future the platform can be expanded into other commodity markets. Any perspective market where transformation of commodity volumes and customers has hurdles and impedes optimization can benefit from frictionless flows and reduced reconciliation efforts.

IT was enthusiastic, Communications helped us

Uniper IT was very enthusiastic to work and learn while implementing the Blockchain solution. The use case presented a very good opportunity for a «sand pit» environment, where new relatively ringfenced business could be enhances with new digital. The hurdles we excepted to encounter were the stability of legacy systems offering an acceptable operational solution and the focus of our small-scale LNG business on the development of the customer base and on quick rollout of the fueling station network. This may have put the work on specification and testing of the Blockchain platform lower on the

priority ladder. These challenges never quite went away, but once the PoC and then MVP rollouts followed, the momentum was in place and the development process steady.

For business development purposes, visibility and communication are key We have been working with Communications to promote Blockchain internally, as well as externally. We also exchanged the experiences of our Blockchain journey with companies from other branches, which has been very helpful. Such discussions revolve around technology but are in fact about vision of the future of many industries.

Major lesson learned was how to balance strategic visionary development work with the day-to-day business priorities. Shorter term targets are often more critical and it requires constant communication and good arguments to get time and effort allocated where you think the company should grow.

Fortunately, energy industry more and more embraces the fact that adaptability and constant rethinking of the business processes are key success factors, something that ensures that companies will continue provide value for the customers. Creative energy and entrepreneurship have always been necessary in the pursuit of profitable position. The gas market is a living proof for that – the integrated business model had to evolve with the onset of liquid gas hubs and after that the megatrends of decarbonization, decentralization and digitalization needed to be addressed. Fortunately, Uniper possesses strong capabilities making success possible. Among them are customer-centricity, experience in energy asset operations, strong culture of innovation. The Blockchain project of small-scale LNG platform built upon these strengths and showed possible way towards growth in a new market space while addressing complexity.

The interview was conducted in November 2019.

Dr. Grigory Shevchenko
Senior Account Manager, Gas Supply & Origination, Uniper

Native of Saint Petersburg, Grigory has received his PhD in Bremen and applied his background in international financial markets in commodity business. Starting his European career at E.ON Ruhrgas AG, Grigory has accomplished many transformational and business projects around origination, portfolio management, commodity innovation, trading, new market entries, business and IT leadership. His current focus is in origination of gas structured deals and new business models in the low carbon space. Grigory builds his work upon front-to-end knowledge of trading environment, successful track record of profitable business streams, counterparty and customer relationships.

(Continued)

He sees his mission in generating and implementing trading business transformation ideas. He builds upon extensive network of industry contacts and bridges it with Uniper's strategy and capabilities with one goal to create a sustainable P&L flow. He innovates in all aspects of commodity space, including low carbon commodities working along Uniper's mission as a leading European midstreamer potentially bringing substantial value to customers pushing for sustainable, secure and economic energy supply. He is also active in academic aspect of energy marketing and trading academically. He was a frequent guest-lecturer at Gubkin State University of Oil&Gas (Moscow) and St.-Petersburg State University of Economics.

9) Chargeurs Luxury Materials: Looking for a technology to share data within the supply chain

Francesco Santoro, Chargeurs Luxury Materials

Chargeurs is a global, diversified group with leadership positions in niche markets, both in manufacturing and in services. It operates with four business divisions: Chargeurs Protective Films, Chargeurs PCC Fashion Technologies, Chargeurs Museum Solutions, and Chargeurs Luxury Materials.

Reporting on the origin of materials becomes increasingly relevant with the ratification of the Sustainability Directive of the European Union (CSRD) in early 2023. A platform-based approach to gather the necessary information via Distributed Ledger Technologies may be the most efficient way to handle the data.

This case serves as an example how digital technologies can extend the value proposition of already existing business lines, while perceiving stricter regulatory requirements in terms of reporting standards as a business opportunity rather than a threat.

Background: Looking for a technology to share data

Chargeurs Luxury Materials started its project with a preliminary study to assess the available data technologies that were suited to support the division's requirements in terms of traceability and supply chain transparency for itself, its customers, and its supply chain partners.

For this purpose, these technologies were divided into two groups, i.e., into widely used major technologies and new, disruptive ones. The best candidates in each case were selected with the help of a SWOT analysis.

From a technical standpoint, the division's main objective was to find a technology that allowed its teams, partners, and customers to easily and securely share data.

At first the traditional Salesforce-based solution came to mind. Eventually, though, the shortlist comprised only two candidates: an application backed by a decentralized Blockchain and an application based on Salesforce infrastructure and its Platform as a Service tools.

In the end, Blockchain made the grade due to its third-party auditability, decentralization, traceability, and non-repudiation of transactions. All these characteristics supported the division's demand to make their product traceable and transparent (as to ethical sourcing), and to use these assets in terms of a value proposition for their customers.

Of course, adapting a new technology can be risky; it lacks maturity, and the success stories as to its implementation are still rare. However, since Blockchain was the only technology to satisfy the division's requirements, Chargeurs Luxury Materials went for it. If it worked, the strategic and organizational benefits would be high.

Implementation

Chargeurs Luxury Materials belongs to Chargeurs Group. This structure enabled the division to use their own resources as well as those of the Group.

In order to prepare the project's implementation, the division built a diverse team including experts of the textile industry, who had been working with the division, and IT experts. The IT experts came from both the division and its partners. Their task was to design the data model. The technical development was externally handled by a startup.

In terms of project organization, Chargeurs Luxury Materials chose a project manager whose responsibility was to work both with the project team and the startup. The project manager came from the Group's corporate teams. He was only temporarily appointed to manage the Blockchain implementation process.

The task of the entire team was to define the planning process and the related business requirements. A functional specification document was designed for the startup team so that they would be able to implement the solution as requested.

The project manager had the necessary knowledge in terms of Blockchain technology.

Due to the way they organized the implementation process, Chargeurs Luxury Materials succeeded to produce the necessary documentation for the technical team to start the development in February 2018 and complete it in June of the same year.

Private Blockchain and Ethereum

Chargeurs Luxury Materials uses both a private Blockchain, that stores the supply chain data on a private decentralized infrastructure, and the Ethereum public Blockchain, that contains an anonymous version of this data.

This way the division can use a private Blockchain to keep their business data safe, and at the same time guarantee third-party auditability in the public Blockchain.

However, all partners of the division have access to the private Blockchain. If there are data modifications, they will appear in the public Blockchain as well.

What can be seen on the public Blockchain is a code calculated from the private Blockchain data that continuously changes as the data in the private Blockchain changes.

In other words, the public Blockchain is used to audit system changes of the private one and ensures the division's customers that data on the private Blockchain will be traced on the public one. Even if the private Blockchain were to shut down, the history of its changes would still be available on the public one.

However, the private Blockchain will protect the confidentiality of some information, such as the production volume information of a partner, to name just one.

The application as a core element

Since Blockchain is used to log the transfers of materials and their transformation into a product as transparent parts of the supply chain, it has become a core element of Chargeurs Luxury Materials. Another advantage of the visibility of the new platform has been the possibility to detect fraud. With the help of Blockchain, Chargeurs Luxury Materials has been able to observe, for instance, if the weight of goods that have been received is the same as the weight of goods that have been shipped. If not, the system will automatically generate a notification and thus serve as a prevention of fraud as well.

Customer participation

Chargeurs Luxury Materials is at the bottom of the garment production supply chain since the division only deals with a raw material (wool). However, thanks to their Blockchain platform, they are now also playing a coordination role for the entire supply chain, which means, that fashion brands have turned into their direct customers as well. These are renowned companies that decided to actively use the Blockchain platform of Chargeurs Luxury Materials, where they can check data coming from the division and its supply-chain partners. So far these are four big direct customers. Overall the division by now manages data coming from more than 20 partners.

It is worthwhile to note, though, that the system does not contain confidential and sensitive information, such as prices and financial transactions, to name only some.

Chargeurs Luxury Materials owns the platform and can monitor the access and the data uploads. In addition, the data within the Blockchain is connected (via an application programming interface) to a responsive website that final consumers can access by simply scanning a QR code.

As of today, the division does not yet have the exact information on how many people are scanning these QR codes. Monitoring the access of their customers and partners has shown about 80–90 uses per month. The division's own teams and partners add data on a bi-weekly basis.

Customers do not pay an extra fee for the transparency the division's Blockchain offers. Instead they pay a premium included in the product price to benefit from this service.

Next challenges

So far the platform has been regularly used by the division's internal teams, its supply chain partners, and its customers. Customers access the platform to obtain information regarding the products that they purchased from Chargeurs Luxury Materials and the respective supply chain. As of today, there are thousands of data available that increase weekly.

By now the division has integrated new features into its Blockchain to improve both the performance and the robustness of the application. One of the issues was the process of big data volumes, where the performance for users trying to retrieve the data had been below expectations. Changes were made to scale from hundreds to thousands of data.

As to next steps, Chargeurs has identified both technological and organizational challenges. Technologically, the system still needs to be tested with big data workloads. Performance and reliability will have to be checked under this condition as well.

Another challenge relates to the interface of the division's platform with the IT systems of its partners and customers. The division's Blockchain platform requires a large number of data from its partners and is currently working with them to create data exports that can be sent automatically to the division's platform thus making data extraction more simple and convenient.

Speed is another challenge. Chargeurs Luxury Materials is trying to provide its partners with an automatic tool to produce the necessary data faster than today.

Organizationally the division is faced with the challenge to transfer full platform ownership and expertise from the project team to the end users, including those who have little IT expertise. This is difficult as the project manager was hired only temporarily from the Group and the platform's technical development was outsourced. The division's plan is now to train the end users and make sure that they acquire new competencies in IT without having either to ask for experts from the Group or hire someone from the outside.

Business potential

Chargeurs Luxury Materials decided to use Blockchain because this technology provided a value proposition for its customers. In the fashion industry it was thus the first company to offer end-to-end traceability.

Due to this competitive advantage, the division gained new customers. In addition, it improved its standing in the fashion industry; according to market research results, this industry is now focused on product sustainability, traceability, and transparency. Therefore, Chargeurs Luxury Materials expects that it will acquire and serve even more customers in the future.

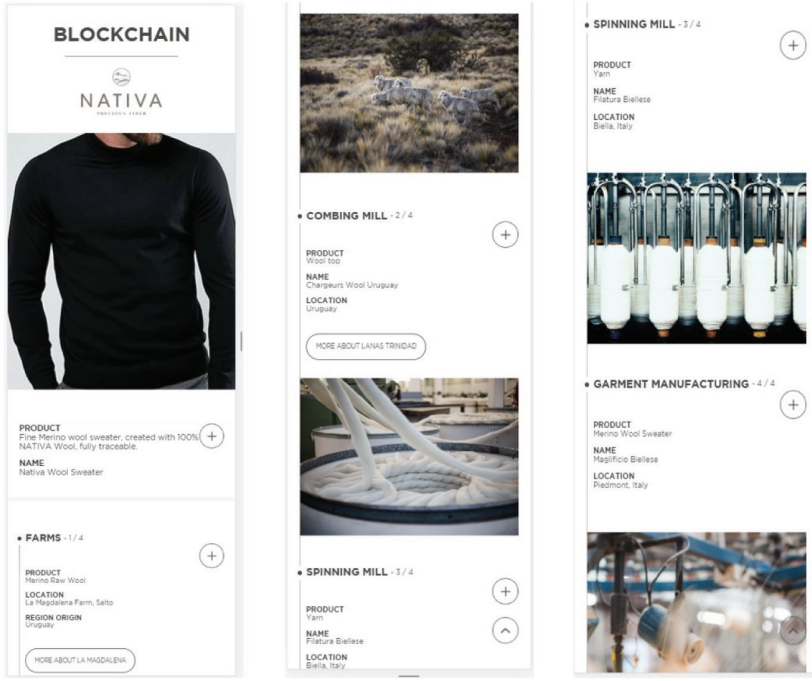

Figure 10: Screenshot of the NATIVA™ Blockchain Website.
Source: Santoro (2021).

The main business potential, though, is seen in the competitive advantage and in the platform's support of sales in the short and the long term.

Internal acceptance of Blockchain

Since the beginning, the project was perceived as highly innovative and disruptive. People were interested to understand how Blockchain worked and wanted to know what the division meant to do with this technology.

It was the first time in the history of Chargeurs Luxury Materials that such a project was undertaken –and the first for Chargeurs Group. So the questions were coming from within the division and from other business divisions.

While the project was met with considerable interest, people particularly wanted to know, what was the business potential, the implementation challenges, and the customer feedback.

Therefore, the division invested time to first present the Blockchain project to its own teams. For this purpose, it prepared presentations and demos with the help of its marketing experts.

In the beginning, the priority of these presentations was to align the division's operations and sales teams and instruct them as to the benefits and limitations of the new Blockchain platform. It was vital that they understood the system properly so that they could explain it to their customers.

Then the division provided information about the project to all teams and employees of Chargeurs Group using the Group's newsletter (sent on quarterly basis).

The information output regarding the Blockchain project and its main milestones continued during the whole process. This was extremely important as it was the first step to share the experience gained from this project with all other Chargeurs business divisions.

Next Blockchain users within the Group

Given the successful completion of the project, Chargeurs Luxury Materials received a number of internal requests for further information. They came from those business divisions that were willing to test the concept and see if the technology could apply to their own operations or product offering as well. The division Chargeurs Technical Substrates has by now decided to build a Blockchain platform for the traceability of technical textiles. This project started in June 2019. Their project team has been selected internally and they are working with the same startup for the technical developments Chargeurs Luxury Materials used.

The division Chargeurs PCC Fashion Technologies is also looking into Blockchain to answer questions from their customers in the fashion industry.

In short, the Blockchain project of Chargeurs Luxury Materials paved the way to adopt the technology on Group level for all cases where this technology will be advantageous.

The interview was conducted in November 2019.

Francesco Santoro
Digital Project Manager, Chargeurs

Francesco has been Project Manager at French company Chargeurs, a leading textile manufacturing group, since January 2018. Beforehand, he received a Master of Business Administration at the Collège des Ingénieurs.

In 2015/16, he held a position as Software Engineer at 6WIND, being responsible for the integration of 6WIND solutions with Openstack cloud orchestrator, managing technical partnership with Mirantis, and being in charge to develop new features to 6WIND products.

10) Innofactory: Creating a Blockchain hub for the Swiss banking industry

Mark Chardonnens, innofactory

The Berner Kantonalbank BEKB (Bernese cantonal bank) counts around 470,000 customers, mostly in the Swiss capital's canton, Bern, and the adjacent Solothurn region. Founded in 1834, the bank became Switzerland's first digital marketplace for tokenized assets in December 2021 (Frick, 2021).

Setting up a new venture within a traditional organization requires strong leadership skills and an awareness of the necessity of digital disruption, which is communicated by agents of change, and an institutional setting that allows for experimentation.

This case highlights the importance of integrating internal stakeholders, especially top management, and external customers into the innovation process.

Background: Digital innovation made in Switzerland

The Innofactory is a joint venture between Berner Kantonalbank, which is one of the largest banks in Switzerland, and the Hypothekarbank Lenzburg, one of the smaller banks in Switzerland. They are two of the most digitalized banks in Switzerland. The joint venture combines the different cultures of these banks: the small one that quickly brings innovation to the customer, and the larger one that tries to leave behind its conservative past and become more innovative. The Innofactory is somewhere in the middle, trying to create solutions for customers in the financial industry.

The Innofactory is like a marketplace where projects get pitched, funded, and implemented. In the financial industry, all the banks can join and participate, for example by giving 20 percent of their money toward a project as well as providing 10 people to work on it. For each project, we try to find partners. If it is related to software development, we collaborate with software developers. If it is for the hardware industry, then we look for an industry designer, for example. If we reach the project goal, then every partner who participated in the project gets the whole solution and can start to work with it. They can even use it for Open Innovation. The partners can do what they want with the results.

Before my personal involvement with the Innofactory, I worked as a software developer, building up the IT architecture for the Berner Kantonalbank. The writing of my master's thesis on innovation management coincided with the start of the Innofactory.

The project: Integrating blockchain in the banking world

In 2019, after finishing a big project, we held a reception, during which a senior trader approached me to talk about the massive changes for trading coming in

the future. He said that integrating distributed ledger technology could help when trading. I also thought it was an interesting technology. I thought that we should start a new project in the innovation department so that we could have a research area to become more familiar with the idea of blockchain. Could we bring blockchain to the banking world? Which hurdles would we face?

One or two weeks later, the board members of the Berner Kantonalbank decided during a strategic meeting to start a research program on DLTs, or distributed ledger technologies. The strategic side and the execution side were created together. This was to find out whether it was a topic for the bank to pursue or not. We wanted to understand which systems already existed, how to adapt them, and even how to use them without any changes. How could we bring blockchain to normal trading?

The proof of concept

Our first goal was the proof of concept and to put 100 tokenized shares on a marketplace. My colleague from the reception could buy these 100 shares through the marketplace. Will we get the match? Will we get the orders? Can he execute the orders?

It took us four months to accomplish this proof of concept. In our test environment, defining the conditions was not a problem. At the beginning, to be honest, we thought we would go from failure to failure to find out which systems had to be manipulated and to adapt all the systems. However, at the beginning, we actually did not have any problems. The systems were very open, and we were able to configure parameters to pass all the systems. We understood how to get the Blockchain and the core banking system to interact. We wrote a simple application. It took four or five days to include all the tokens that we saw on the Ethereum Blockchain. We could rebuild a depot or portfolio with the normal shares in the core banking system and bring these two worlds together without any great obstacles.

We then returned to the board members and put two TVs in front of them. In the middle, we placed a projector. On the first TV, I spent my 100 shares. We said, «Now we are on the marketplace. You can see here my placement.» My colleague went to the marketplace, took these 100 shares and wanted to buy them. We showed them the matching place and the matching engine. On the execution engine Etherscan, we showed that the transfer was made. This was a key moment in this project because most of the board members did not realize what Blockchain technology was. For the first time, they saw it in action as well as its power. Since the share registry is updated in almost real time, one can see if somebody switches shares. The settlement is done instantly – we call it T+0. In the conventional world of banking, we have T plus two days or up to 40 days, depending on the share. This was really a huge moment. The board then responded, «Okay, cool stuff. But what can we offer to the customer?» Figuring that out was the next step in the project.

The technical side and customer integration

We started to build a product description with the Business Model Canvas and Value Propositions. We generated many ideas, even those that we knew would not work for the customers. After several iterations, we found a way for the customer to access digital assets. However, we decided not to include cryptocurrencies, because at this point in the project, cryptocurrencies were considered «bad things,» «dark things» in the banking world. We instead wanted to tokenize some shares.

Coming from the technical side, it was totally clear for us that every client would have a wallet. The bank would manage the wallet and customers would have access to their wallets via e-banking. They would not have to install another app or get a special ledger. Instead, everything would be fully managed by the bank. We developed a prototype and went to customers to validate our idea. Around 80 percent of the customers responded with, «What is a wallet? Why do I need a wallet? I don't want a wallet. I just want to get the digital assets.» We were stunned, asking ourselves, «What is the problem with this wallet?» First of all, most of the customers did not even know what a wallet is. We learned that we needed to make more of an effort in the knowledge transfer to the customers so that they understood the function of a wallet. We decided to change our strategy. We kept the same validation process, but we avoided showing a wallet to the customers. We instead just presented the depot as they were used to with their other shares, allowing them to simply make a transfer to that particular depot. This turned out to be no problem for our testers. At this point, we decided to switch direction and build a solution for our customers. They did not care whether they used a wallet or a depot, or anything else. They just wanted the shares from Nestlé, UBS, and the like. Maybe they also wanted to tokenize shares from a company, but all-in-one.

This was a strange period in the project. On the one hand, we worked on the specifications for how to implement all the high-security modules and bring the wallets together to the core banking system. However, on the customer side, we faced tremendous differences with the proof of concept that we had initially made. We had to change it. Fortunately, we did not lose a lot of time with that, but for us it was a bigger problem than the technical side.

Building the innovation ecosystem

After the validation, we moved ahead with finding some partners who would help us build an ecosystem. For the primary market, we needed a partner that was able to tokenize the whole capital structure of a company. We needed a partner that could also take care of the legal requirements. We needed the technical

part for the HSM, the high security module, and for the wallet infrastructure. Finally, we needed another partner for the trading system, the matching system, the execution system, and all of that.

We made an RFP, request for proposal, sent it out, and got some answers.

At the end of August in 2020, we found a partner for the primary market. For the infrastructure, we would team up with Hypothekarbank Lenzburg and Taurus. For the trading system, we partnered with a company that already had such a system in the Berner Kantonalbank.

At that point, the bank decided to start a normal waterfall project for building all the systems. The Innofactory was out of the project. But after three months, they realized that Innofactory would be better suited to complete the project in the required time to market – or even in a shorter time to market. They wanted to have a chance to be one of the first in Switzerland to offer this digital asset. We decided to return to this project but to change the whole project setup. We said, «Forget waterfall!» We started to apply Agile ways of working, with the goal of being technically ready within three months. At the end of November, we started with the first sprint. Already by the end of December, all of the technical functionalities and basic infrastructure were ready and installed, including all the network connections used to interact between the systems. In January, we had finished building up a new high-secure module. At the end of February, technically we were completely ready, and in March we planned to start tokenizing some shares.

We also had to get approval for our project from the financial authority, the *Finanzmarktaufsicht*. We explained the whole project step-by-step, and they raised questions such as: «Where are the tokens generated? On which chain is it? Is it public? Is it private?» This was the moment when we realized that we had to bring our know-how to these people as well and take them on our journey. For that, we needed some months.

In August 2021, we started with the operation of the system and were able to open wallets. We looked for companies that were interested in tokenizing their shares and found them. But your company is not ready to tokenize shares until a decision to change the charter is made by the general assemblies, or as it is called in Switzerland, Statuten. Once this is done, it has to be announced by the commercial register (*Handelsregister*) to let the public know that the company has changed to tokenized shares. This process took time.

The lessons: Communication and seamless customer integration

For me, one key moment during the project was during the meeting of the management board when the board members came to understand Blockchain technology. They could also play with it on their mobile phones and see it,

«Okay, it's that way. It's on Etherscan, I can see that.» From that point onward, they were very supportive, even if at the start of the project we had to invest a lot of money and earnings would only come much later.

A second big lesson was the effort we had to undertake on the legal side. At first, we thought that it was a technical project and that we were bringing a new technology to the bank. But we underestimated the legal requirements.

Yet another lesson learned was how to inform the employees of the bank. Around every month we taught new employees about Blockchain, what Ethereum is, why we use an ERT 20 token for that, and what we are generally doing. We also had to do that with the advisors so that they would be able to explain it to their customers. Coming from the technical side, we had to switch to the commercial perspective. Around the second sprint, we decided that we had to bring all the «product guys» into the project. They had to understand what we were doing in order for them to write a product description. By bringing in people and informing them early on in the project allows them to help you make a good product that will be accepted by the customers.

Where we are, and a glimpse into the future

We are now at a point where we can communicate the benefits of the technology. One of them is the time issue. Banks can get more capital, new capital, much faster than if they offer an IPO or something similar. Banks can also bring projects together. For example, all the small and medium-sized enterprises from a region can be enclosed in a single project that customers can invest their money into. This allows the bank to build new products, not only regionally but also within industries or branches in a so-called enclosure product asset allocation. Companies can adjust their processes for new shareholders, for example, by welcoming them. General assemblies can be organized on the Blockchain. It is so much faster from a governance perspective for shares, rights, and for combining products or developing products.

For the next step, we want to open the marketplace. At the moment, you have to be a customer of the Berner Kantonalbank if you want to trade something on the marketplace. We also plan to open it up to third banks to bring their orders to the marketplace. We also want to make advances with respect to cryptocurrencies. On the technology side, we are able to store cryptocurrencies in the wallet – this is not a problem. But from a legal perspective, the bank has to decide whether it wants to do that or to instead wait. In addition, we have some topics in the pipeline, such as NFTs, non-fungible tokens, and would they – from a marketing perspective – become part of a new brand that we want to establish, or would they be part of the same brand?

The interview was conducted in February 2022.

Mark Chardonnens
CEO, Innofactory AG

Mark became the CEO of Innofactory in early 2020. Beforehand, he worked for 15 years in various functions at Berner Kantonalbank AG, including the head of IT architecture.

He received his academic education at the Berner Fachhochschule BFH, including a Master of Advanced Studies in Information Technology.