BLOCK START

D4.1: BlockStart DLT solutions portfolio - 1st call

10/2020

Work Package	WP4 - Pilot
Document Reference	BS-WP4-D4.1-BlockStart-DLT-solutions-portfolio-1st-call
Document Type	DEC (Websites, patents filling, etc.)
Author	BRPX
Contributor(s)	CIVT, F6S
Delivery Date (DoA)	31/10/2020
Actual Delivery Date	31/10/2020
Abstract	Compendium of the DLT solutions developed throughout the programme.

Document Revision History			
Date	**Version**	**Contributor(s)**	**Description**
27/10/2020	v1.0	BRPX	First version
30/10/2020	v1.1	CIVT, F6S	Second version including CIVT and F6S inputs
31/10/2020	Final	BRPX	Final version including review by BRPX

Dissemination Level		
PU	Public	X
PP	Restricted to other programme participants (including the EC Services)	
RE	Restricted to a group specified by the consortium (including the EC Services)	
CO	Confidential, only for members of the consortium (including the EC)	

BlockStart Consortium			
Participant Number	**Participant Organisation Name**	**Short Name**	**Country**
1	Bright Development Studio, S.A.	BRPX	PT
2	UAB CIVITTA	CIVT	LT
3	F6S Network Limited	F6S	UK

LEGAL NOTICE

The information and views set out in this application form are those of the author(s) and do not necessarily reflect the official opinion of the European Union. Neither the European Union institutions and bodies nor any person acting on their behalf may be held responsible for the use which may be made of the information contained therein.

Funding Scheme: Coordination and Support Action (CSA) ● Theme: H2020-INNOSUP-03-2018
Start date of project: 01 September, 2019 ● Duration: 30 months

Table of contents

1. Introduction

This report compiles the DLT solutions developed in BlockStart's open call #1 Prototype and Pilot stages, which took place from April until October 2020.

The Prototype stage included 10 teams (2bSmart, Bright Habitat, CROPT, Datarella, Euroledger, Infidia, Inova DE, Kedeon, REXS.IO, Xylene).

5 of those teams (2bSmart, Datarella, Infidia, Kedeon, REXS.IO) were selected to the Pilot stage, implementing their solutions in End-user SMEs.

2. DLT solutions portfolio

2.1 2bSMART

2.1.1 Company

2bSmart supports organizations in understanding and applying IoT sensor, blockchain and smart contracts technology. It does this by offering interactive workshop simulations. These simulations show a business process of monitoring and settlement of performance using smart contracts, sensor data and blockchain.

These simulations can be used in businesses for training and awareness but are also a starting point for a pilot project using smart contracts. The company customizes these blockchain simulations to make it applicable for any business sector. Its workshop simulations are also very suitable for educational purposes at universities and professional trainings.

2.1.2 Prototype solution

2bSmart, with three companies from the Facility Management business in the Netherlands have developed a prototype to monitor and control the indoor office climate. It uses IoT sensor technology combined with blockchain smart contract technology to create an additional layer of trust. The sensor data will be stored on the Blockchain for verification and the smart contract will issue certificates and provide access to the rooms based on the sensor measurements and pre-set conditions.

The prototype is build based on existing Smartys Simulation IT building blocks. The prototype location is the head office of Facility Management Consultancy company DWA in Gouda (NL). There we are using existing sensors and sensor data, connected to our Smartys IT Building Blocks, including the smart contact.

As an important part of this pilot, 2bSmart has designed a protocol to ensure the integrity of the sensor data. It is called SSDI, Smartys Sensor Data Integrity protocol. The key reason for this is to ensure that the users of the proposition can trust that the data that is used to action the smart contract, is validated, from the right sensor and is not tampered with.

2.1.3 Technical development during Prototype stage

During the development of smartys, the following technical developments has taken place:

- Connect to the real local sensors in the building
- Build on the Meteor/React Smartys platform
- Add data storage security requirements because info on buildings can be sensitive
- Replace temperature with air quality in smart contract
- DWA to add sensor data analysis and aggregation to the pilot
- Use traffic light systems, in pilot with raspberry pi
- Connect solution with Digital Twin of the Gouda building
- Data protocol for connection sensor data – smart contract tested. MQTT adjusted
- Sensor registration process tested and adjusted

- Design and testing of the air quality norms to be used, including frequency of data sending and storage
- Sensor data connection retested with Smartys
- UTP network used and tested for the pilot

2.1.4 Business development during Prototype stage

A number of workshops have taken place with the companies in the prototype development. 2bSmart has also engaged with potential customers, being companies renting office spaces. Very positive feedback was received. A very solid business case has been developed.

If the pilot is successful, the 4 companies involved intend to form a JV to further develop and market the product in the Netherlands and Europe.

2.1.5 Pilot stage implementation

Here is a video summarizing 2bSMART's pilot implementation: www.youtube.com/watch?v=Y28EotDfKfM&t=1s

In BlockStart, 2bSmart implemented its "SMARTYS" product in 2 SME adopters:

Pilot no. 1 with DWA:

Corona Proof Office

An end-end system to measure, monitor and control a Corona proof indoor climate.

Tested setup with 2 types of rooms (automatic and manual headcount).

Pilot no. 2 with BR Controls:

Corona Proof Office

An end-end system to measure, monitor and control a Corona proof indoor climate.

Tested setup with 2 types of rooms (automatic and manual headcount).

2.1.6 Testimonial

"In the first iteration of the BlockStart programme we concluded that there was a potential match between some SME's in the programme and a product gap that we wanted to address: Integrity of sensor data. We developed a Smartys Data Sensor Integrity protocol for this. We engaged three SME's into the programme which enabled us to validate this product-market proposition. As a next step we defined a specific application for this proposition for the engaged SME's: Monitoring safety conditions in meeting rooms for Corona proof buildings."

Robert Rongen, CTO, 2bSmart

2.1.7 Public profile

This and further information is publicly available on the following webpage on BlockStart's website:

www.blockstart.eu/portfolio/2bsmart/

2.2 Bright Habitat

2.2.1 Company

Bright Habitat is VizLore Labs Foundation spinoff, with the mission to lead regional ICT technology related innovation and seed entrepreneurship culture. Bright Habitat promotes a wider usage of cryptocurrencies with its AI based cryptocurrency trading solution and lowers the blockchain technology adoption bar by providing ChainRider Blockchain as a Service solution for simplified, user-friendly and fast blockchain development.

2.2.2 Prototype solution

ChainRider Blockchain as a Service:

There is a scarcity of blockchain developers, and building internal competencies is expensive and time consuming. The process of building blockchain based prototypes and MVPs usually lasts a couple of months. Existing blockchain solutions are either too generic or self-centered, incomplete, and hard to integrate with existing systems.

In order to overcome these issues, we provide ChainRider Blockchain as a service solution. ChainRider BaaS drives wider adoption of blockchain technology by offering fast prototyping (minutes instead of months) and easy to use blockchain service for fintech. Through simple web forms, the end user is able to configure and deploy a blockchain solution and with a web developer knowledge integrate it with existing business workflows and applications. ChainRider comprises three main services: 1. Blockchain network generator which makes setting up a permissioned Hyperledger Fabric blockchain easier than ever before. Users can choose to deploy their network on local infrastructure or use our click-to-deploy feature to deploy the blockchain network on Google, Amazon AWS or Microsoft Azure cloud in less than 15 minutes. 2. The Smart Contract Generator service allows for the creation of Hyperledger Fabric NodeJs smart contract to be built and deployed in less than a minute. 3. Blockchain marketplace comprising advanced smart contracts and blockchain network templates which help users add more sophisticated features to their networks and build MVPs even faster.

ChainRider AI-based cryptocurrency trading:

Reports indicate that more than 95% of traders are losing money. The average individual investor underperforms a market index by 1.5% per year; and active traders underperforms by 6.5% annually. Among all day traders, nearly 40% trade for only one month. 80% of day traders quit within the first two years.

Relaying on individual financial indicators alone is not enough for successful trading. Manual order execution is unfavourable as it requires strict discipline, emotional distancing and often leads to errors.

In order to solve the cryptocurrency trading challenges experienced by 95% of traders, Bright Habitat has applied concepts such as artificial intelligence (AI), data analytics and automation. Its solution is based on its real-time growing data set, which currently counts close to 1 billion data points of executed trades. In order to capitalize on this data, the company employs AI which uses deep reinforcement learning to generate trading signals for 5 cryptocurrencies: Bitcoin, Ethereum, Bitcoin Cash, Litecoin and Dash. Deep reinforcement learning field of research has been able to solve a wide range of complex decision-making tasks that were previously out of reach for a machine. It is a category of machine learning where intelligent machines/agents can learn from their actions similar to the way humans learn from experience. This concept is at the core of Bright Habitat's trading solution and it yields significant return of investment, by detecting correlation between more than 30 financial features simultaneously. The company's solution enables automated execution of trades in customers' accounts with its order execution engine, driven by AI-generated trading signals. Its current machine learning models provide return of investment which ranges from 0.82% to 1.95% per closed trade, depending on the portfolio spread (selected cryptocurrencies). On average, the return of investment for the first 5 months of 2020 was 101% (with included exchange trading fees of 0.15%).

2.2.3 Technical development during Prototype stage

ChainRider Blockchain as a Service:

Through BlockStart, ChainRider BaaS has been expanded with a service named ChainRider Marketplace. The marketplace is a space for publishing templates of more sophisticated and use-case specific Hyperledger Fabric smart contract and blockchain networks. The prototype phase enabling the marketplace has included the following development milestones:

- UX & UI design of the marketplace, dashboards, user management, corporate registration and new pricing model
- ChainRider Python3 and NodeJS backend applications have been expanded to support marketplace workflows, dashboard, user management and corporate onboarding. This included REST APIs for: resource usage for dashboards, payments and plan management, user management and invitations, registration of corporate entities, publishing of smart contract and blockchain networks on the marketplace, creating, generating and deployment of blockchain networks for corporate users
- The aforementioned features and services were also implemented on the ChainRider frontend application in Angular 8 in line with the UX and UI wireframes
- 19 smart contracts have been added to ChainRider marketplace, showcasing: CRUD operations, bulk CRUD operations, communication with 3rd party APIS from smart contracts, contract-to-contract communication, private-to-public blockchain interoperability, etc.
- Our 1-year product roadmap:
  - Migration to Hyperledger Fabric 2.0 (Oct 2020)
  - Support for fully managed blockchain as a service solution (Dec 2020)
  - Vault management of cryptographic material (currently part of the configuration archive) (March 2021)

       ○ Opening marketplace for contributions by ChainRider users (June 2021)

ChainRider AI-based cryptocurrency trading:

With BlockStart, Bright Habitat has been able to optimize its deep reinforcement learning models used for generating trading signals, by adding four new financial features:

- Stochastic oscillator
- Moving Average Convergence Divergence (MACD)
- Hull Moving Average (HMA)
- Ichimoku Cloud

The architectures of the neural network models have been changed accordingly: updated number of layers, neurons and dropout. In conclusion, the optimized models' return of investment is on average 30-40% better than the previous models.

An automated trading service (bot) has been implemented for different exchanges and trading strategies:

- An automated trading service (bot) for CoinBase Pro exchange has been implemented to trade with BTC, LTC, BCH and ETH. CoinBase Pro offers industry-grade, safe and secure APIs for order execution and dynamic fee structure
- A combined trading bot capable of trading multiple cryptocurrencies from one account has been implemented for CoinBase Pro exchange. This enables trading with multiple cryptocurrencies based on one trading signal, for example: the bot tracks the trading signals generated for ETH, but reacts by trading ETH, BCH and LTC
- An automated margin trading service (bot) for Bitmex exchange has been implemented to trade with ETH and XBT. The bots working on the Bitmex exchange have been optimized for short positions

The following product roadmap is envisioned for ChainRider AI based trading solution:

- Implementation of trading bots for new exchanges (Binance, BitFinex, Houbi) (Sept 2020)
- High responsive trading signal generation (from 1h to 5 minute) (Nov 2020)
- Optimized models with new financial features combining LSTM and DRL (Dec 2020)
- Building a web/cloud platform and providing AI trading solution to end users – B2C business model. (Feb 2021)
- Order routing support (March 2021)
- Automated service for strategic spreading of portfolio for high volume transactions (May 2021)

2.2.4 Business development during Prototype stage

ChainRider Blockchain as a Service:

- Bright Habitat's pay per use business model with individual accounts was not well received by larger companies looking to have collaborative environment for their blockchain development teams and to be able to more precisely plan the budget for their blockchain projects. In order to solve the challenge, the company upgraded the ChainRider BaaS solution to support

registration of companies with multiple team members with different access rights. It has also updated the payment model for registered organizations by providing multiple tiers with monthly plans depending on the amount of resources available for blockchain network hosting, thus allowing solution adapters to properly plan the budget for their blockchain projects. An administrator of the registered organization can invite other users to join the organization on ChainRider, thus sharing the organization's resources. There are two pricing plans, Academic and Corporate, each offering multiple tears enabling flexibility of resource usage. In general, the tiers are formed based on the amount of resources available for hosting blockchain solutions on ChainRider platform, but each tier also include access to specific set of tools and services available on the platform as well as technical support

● Bright Habitat has compiled a business brochure for ChainRider Baas and collected information about 90 companies in Hyperledger Fabric business domain. 66 invitations have been sent on LinkedIn. 35 invitations were accepted, and multiple follow-ups have been performed with them. With 4 of the invitees the company has organized a teleconference call and presented the solution. In addition to LinkedIn campaign, a cold email campaign has been run using the aforementioned business brochure for the initial contact.

● Bright Habitat has acquired 2 paying customers during the project and 3 declarations of commitment from SMEs interested in participating in the pilot stage. It had 9 commercial presentations of ChainRider BaaS service. At the end of the Prototype phase, they plan to hire a sales and marketing associate.

● Multiple blockchain networks (10+), mapped to specific use cases were deployed as part of the live demo performed for potential adopters of the ChainRider BaaS solution. Bright Habitat has also published video learning materials accompanying implemented blockchain marketplace templates and included them within the ChainRider knowledge base.

ChainRider AI-based cryptocurrency trading:

● As part of AI-based cryptocurrency trading service, Bright Habitat differentiates two business models (depending on who handles the order execution):
   ○ It provides trading signals and customers handle order execution: This includes signing a Revenue Share Agreement with a 20% performance fee (20% of the generated profit) charged on a quarterly basis.
   ○ Customers set up an account on the desired exchange (currently CoinBase and Bitmex exchanges are supported) and the company execute orders based on its trading signals. Customers decide on the portfolio distribution and share API keys that enable trading with Bright Habitat. The company sets up ML models, bots and start order execution in less than 24 hours. This includes a 2% AUM fee (annualized) and a 20% performance fee is charged on a quarterly basis.

● Its trading service requires minimum of 200k USD initial portfolio for period of 6 months. The minimal portfolio is derived from the expected profit margin, the effort and cloud resources required to set up the AI based trading solution for a particular client. The initial portfolio from Bright Habitat's experience is usually 2 to 5 times larger than the minimum requirement. The performance fee provided above is negotiable for portfolios larger than 1 million USD

● As part of Bright Habitat's business development efforts, the company has compiled a promotional video which has been made publicly available. Next, it has compiled a brochure which has been used for contacting SME adopters and potential clients. The company has

collected information about 137 funds and OTC trading desks .99 invitations and 5 InMail messages have been sent on LinkedIn. 30 invitations were accepted, and of those 28 were followed up with a message or email. 26 invitees received the promotional video as part of the follow-up communication. With 6 of the invitees, the company has organized a teleconference call. In addition to LinkedIn campaign, a cold email campaign has been run. For this campaign, the aforementioned brochure has been used

● Bright Habitat has acquired one USA-based customer (cryptocurrency fund) which was not able to sign BlockStart's declaration of commitment as it is a non-EU based company. It is also in the negotiation phase with a premium cryptocurrency investment fund also from the USA. The company has had 6 teleconference calls during which it presented the solution to its potential clients. The company has attended the online ANNON Summit 2020, the largest online blockchain conference in the CET time zone

● As a result of the project, and in line with Bright Habitat's exploitation strategy, the company has founded a new company VizLore Digital Asset Management DOO, which will primarily be focused on providing B2C solution for AI-based cryptocurrency trading.

2.2.5 Testimonial

"We had a great time working with the BlockStart team, and we owe great thanks to our mentor Mr. Ugnius Ramanauskas. Feedback received from mentoring sessions helped us to better position our service with respect to the market and improve market visibility. The Prototype phase was quite challenging as we had to simultaneously develop two MVPs and bring them to the level of Minimum Saleable Products though active lead generation, business development and customer acquisition."

Ognjen Ikovic, CEO, Bright Habitat

2.2.6 Public profile

This and further information is publicly available on the following webpage on BlockStart's website:

www.blockstart.eu/portfolio/bright-habitat/

2.3 CROPT

2.3.1 Company

Humanity is in need of innovative solutions to provide healthy food for its growing population. Cropt was founded with a clear vision to change agriculture, one of the most conservative and least digitised areas of industry. It believes that using big data and state-of-the-art machine learning algorithms, agriculture can become greener and more profitable at the same time, for the welfare of farmers, companies, our society and our planet.

2.3.2 Prototype solution

ALLIANCE was formed as an acronym of AgricuLturaL InsurANCE, but it is much more than that. It is a product that uses data and blockchain to ALLY the often conflicted sides, farmers and insurance companies.

ALLIANCE is a data-driven plug-and-play crop insurance product that automatically detects drought on the field and issues a payout through smart contracts, thus a) eliminating the need for large teams of loss adjusters and large numbers of on-site visits for claim verification b) cutting the operational and administrative costs for the insurance company and ensuring objectivity and transparency through designing more accurate and personalized contracts c) securing trust between farmers and the insurance company, which is the most hindering factor for the uptake of crop insurance.

The system is based on blockchain technology, remote sensing and big data analytics. Namely, processed climate and satellite data indicate the existence of drought-induced damages in maize and the percentage of the damage is calculated. Based on the machine-learning-driven yield prediction model, the difference between the actual yield and the yield that would have been achieved if there had not been any damages, is calculated and this difference is paid out to the farmer, through blockchain-enabled smart contracts. This system was developed as a user-friendly, crop insurance product and deployed to alliance.crop.ag. It is envisioned as a plug-and-play product, where the only integration that will be required is that with the company's client database.

2.3.3 Technical development during Prototype stage

The technology developed within BlockStart is a prototype for a plug-and-play product for digital crop insurance. The prototype focuses on one peril, one region and one crop (drought/Serbia/maize). With a planted area of ~1.2Mha, maize is by far the most significant crop, with the country being in the top 10 list of global maize exporters. In the next phase of development, the system will be scaled to other perils, other regions and other crops. The year that was analysed is 2017, the last year in which drought was present.

Drought detection was based on two sets of parameters:

- Climate triggers: low precipitation and high temperature are the initial triggers for considering the drought in the region.
- Satellites triggers: Low NDWI (Normalised Difference Water Index) and EVI (Enhanced Vegetation Index) values. NDWI was developed with this particular purpose, to detect the absence of water in a field (threshold <0.2), while EVI is a general vegetation index that reflects the overall crop status (threshold <0.4).

Based on the satellite thresholds, segmentation of the satellite images was performed and regions that suffered drought stress were detected.

Cropt's plan for the next 12 months is to incorporate other sources of risk in the system and to do a pan-European scale-up, where the product could be used anywhere in the EU without the need for additional calibrations.

The company already had negotiations with several agricultural and insurance companies and it plans to test the system with both its clients (insurance companies) and the final end-users (farmers). This will validate both the business model and the technical approach.

2.3.4 Business development during Prototype stage

- The business model and the potential for adoption were thoroughly analysed, and a series of talks with potential clients (insurance companies) and end-users of the technology (farmers) were held. This was extremely helpful in defining the business model, as well as fine-tuning the product-market fit. Talks included other companies as well, for side business models and project scalability. The primary business model is generating the revenues through franchise and directly targets the insurance companies. Our innovation will come in the form of a software product that can be integrated into the insurance company's IT system. The two following business models were drawn in collaboration with an interviewed stakeholder, a C-level representative of an insurance company, who wished to remain anonymous. Firstly, the product will be offered to farmers via insurance companies, which will deal with customer acquisition and revenue collection. A percentage of the revenue (e.g. 10%) will be diverted to Cropt as the franchise fee and for the system maintenance. The secondary business model targets the insurance companies indirectly, via reinsurers. Insurance companies typically transfer a certain amount of the premiums (e.g. 80%) to reinsurance companies, which collect premiums from a number of companies, thus diversifying their portfolio and lowering the risk of the system as a whole. It is in their interest to include as many insurance companies in their system as possible, and collect as much premium funding as they can. For this reason, they are offering new product lines to insurance companies, which are expected to acquire new customers and increase their own earnings, thus subsequently increasing the earnings of the reinsurance company.
- Cropt had 11 meetings in total, with:
  - Insurance companies. This is the company's primary group of clients and the discussions were very fruitful, as they helped Cropt to better understand the problems with crop insurance they are facing in their daily activities
  - These meetings helped the company understand the problem from the conflicting point of view and get to know what kind of insurance schemes would satisfy the end-users
  - IT companies. Cropt spoke with the fellow IT companies that are also engaged in blockchain driven insurance in other sectors than agri-food, to get acquainted with the obstacles they faced and the lessons learnt
  - Other potential adopters. With them, the company developed alternative business strategies for secondary business models that would support the primary one and generate additional revenues.
  - Investors – for taking the startup to a higher level.
- For the Alliance project, Cropt hired 2 additional people, one data scientist, who led the development of the drought index and satellite processing pipeline and 1 developer, who led the development of Alliance platform and integrated blockchain, satellite image processing and other services into a single system. The company's plan in the next 6 months is to hire an

additional business expert, who would help Cropt present its product adequately, ensure traction and acquire additional investors and clients.

2.3.5 Testimonial

"BlockStart allowed us to step into the world of blockchain-driven crop insurance, a futuristic concept that we always wanted to exploit, but never had the resources and appropriate support."

Oskar Marko, CEO, Cropt

2.3.6 Public profile

This and further information is publicly available on the following webpage on BlockStart's website:

www.blockstart.eu/portfolio/cropt/

2.4 Datarella

2.4.1 Company

Datarella is an established provider of Industrial Blockchain Solutions and develops Blockchain-based innovations for and with their clients and partners with a strong emphasis on the supply chain and ICT sector. The company's clients come from a variety of sectors: aid, insurance, automotive, manufacturing, finance, media, and politics. Key customers include the United Nations/WFP/UNW, UK Department for International Development ("DFID"), Siemens and BMW.

2.4.2 Prototype solution

Datarella has developed a unique blockchain-based solution "Track & Trust" for supply chain tracking. This product allows the tracking of goods globally. "Track & Trust" provides immutability, trust and reliability through the use of a blockchain ledger. While initially developed to support the tracking of humanitarian goods, "Track & Trust" can be adapted relatively quickly to support any SME that wants to digitize their supply chain tracking. Datarella has deep experience making such adaptations.

Organizations can create an event and request sending of goods from warehouses or manufacturers to a defined location in or close to a disaster zone. The entire steps in this process, such as shipment creation, handovers, or the final delivery, are stored on the blockchain. The information is visualized over a web application.

2.4.3 Technical development during Prototype stage

In BlockStart, Datarella improved its "Track & Trust" product from its earlier MVP stage closer to market-readiness. For the MVP, many components and processes were simplified or mocked and very

static in order to show that the actual technology can perform as desired. Therefore, it defined three main KPIs for BlockStart:

- In the first KPI, Datarella focused on a self-registration process for users. In the MVP, it pre-registered profiles and generated Keystore files and passcodes by themselves and sent it to the parties that were participating in the system. To give the users more freedom to register, a self-registration process was necessary. It implemented a user-management backend to store key information that needs to be linked to a specific public key from the user. It further created visible and self-manageable profiles in the profile-view of the web application.
- The second KPI had the goal of enabling multi-tenancy in the system. For the MVP, Datarella didn't have logic implemented to show different content for different users. This led to the result that anyone could see anything in the system, which is far from being favourable in a real-world system. Therefore, it wanted to achieve multi-tenancy to restrict access to specific data only for the authorized parties. As one big milestone, it defined and implemented a role- and permissions-matrix for the system. Roles are now tied to a set of different tasks in the system associated with a profile.
- The third and last KPI was to enable mobile signing of transactions. Until now, the users need to upload the Keystore file and enter the passcode in each session to sign a transaction. Since this is a very user-unfriendly process, Datarella replaced this process with mobile signing. A user downloads the "Track and Trust" wallet that on initiation creates a private- and a public key. This key is linked to the profile. To sign a transaction, the user scans a QR code that contains the shipment information and confirms the transaction on the wallet by swiping. This intuitive and quick process improves the usability of "Track and Trust" significantly.

2.4.4 Business development during Prototype stage

Business model:

For Datarella's "Track & Trust" service, the company will target the market for supply chain management tools which offer last-mile tracking functions. In the last years the humanitarian aid and, therefore, the disaster relief has expanded a lot. This is mainly caused by the increasing number of disasters and the increasing population on earth. This trend is very likely to continue. In 2018, total revenues of global track and trace solutions amounted to some EUR 1.56 billion worldwide, with forecasts predicting that it will increase to around USD 6 billion by 2027 (The Insight Partners, 2019). Datarella's first target segment is the market for medical aid in countries with United Nations Emergency Telecommunications Cluster (UN ETC) Deployments. The company's initially targeted primary market is Yemen which has a EUR 1.4 billion market for supply chain management expeditors

Target customers:

Datarella is targeting the downstream SMEs who participate in the supply chains of large humanitarian organizations for involvement in adoption and testing. One example of an EU SME in this area is the French firm, Atlas Logistique which is one of Handicap International's operational units that specializes in logistics services and supply chain management during humanitarian crises. The company is thus targeting the humanitarian organizations themselves as its core customers. Further, it is targeting

organizations with use cases for a trackable supply chain solution with the potential to increase usability, transparency and the effect it has for the stakeholders

Market analysis:

"Track & Trust" distinguishes itself from competitor products in three crucial aspects:

- Through this blockchain solution, Datarella provides the stakeholders in the supply chain a tamper-resistant single point of truth. This will allow the parties, which often distrust one another, to collaborate
- Datarella has extensive experience with the governance of such consortium blockchains and can provide a tailored governance framework
- The unique ability to offer blockchain-based tracking in the most difficult part of the supply chain, the last-mile, even without an internet connection, sets "Track & Trust" apart from its competitors. This is enabled using satellite connections and long-range radio nodes (LoRa) as well as integration with next-generation 4/5G decentralized networks. Datarella's long-term product roadmap and business plan integrates these functionalities

Go-to-market strategy:

To identify and evaluate potential entry markets for Datarella's envisaged system, the company evaluated the counties the United Nations Emergency Telecommunications Cluster (UN ETC) operates. The UN ETC is a global network of organizations working together to provide shared communication services in humanitarian emergencies. Datarella plans to piggyback on ETC logistics shipments to get its hardware into the countries, so it makes sense to base our market analysis theaters of operation where they are present

2.4.5 Pilot stage implementation

Here is a video summarizing Datarella's pilot implementation:

www.youtube.com/watch?v=_3RskvDwXC0

In BlockStart, Datarella implemented its "Track & Trust" product in 3 SME adopters:

Pilot no. 1 with Zelena Tocka Trans:

Together with Zelena Tocka Trans, Datarella performed a test run in its track and trust system. Hereby, the entire process from the registration until the simulated final handover was performed. As a result, its solution is considered valuable for the process of local food tracking.

The main KPI – simulating a test shipment – was successfully performed. Using the system was simple and intuitive. Datarella also defined changes to the UI for the context of Zelena Tocka Trans.

Pilot no. 2 with Go Limpets:

Together with Go Limpets, Datarella performed a test run in its track and trust system. Hereby, the entire process from the registration until the simulated final handover was performed. As a result, its solution is considered valuable for the process of shipment of limpets and other sea food.

The main KPI – simulating a test shipment – was successfully performed. Using the system was simple and intuitive. Datarella also defined changes to the UI for the context of Go Limpets.

Pilot no. 3 with Albicchiere:

Together with Albicchiere, Datarella performed a test run in its track and trust system. Hereby, the entire process from the registration until the simulated final handover was performed. As a result, its solution is considered valuable for the process of shipment of wine dispensers and wine.

The main KPI – simulating a test shipment – was successfully performed. Using the system was simple and intuitive. Datarella also defined changes to the UI for the context of Albicchiere.

2.4.6 Testimonial

"Even though BlockStart was entirely remotely due to Corona, this program was a big success for Datarella. Starting from the Ideation Kick-Off, we could already identify potential adopters that also participated in the program, and eventually might work together with one in the pilot stage. The potential adopters helped us seeing our "Track & Trust" product from the perspective of stakeholders differently from our intended customers. During the development stage, we managed to improve our product from an MVP-stage close to market-readiness. The KPI definition and frequent calls with our mentor made it easier to focus on the important aspects of our product and held us accountable."

Martin Schäffner, Blockchain Architect, Datarella

2.4.7 Public profile

This and further information is publicly available on the following webpage on BlockStart's website:

www.blockstart.eu/portfolio/datarella/

2.5 Euroledger

2.5.1 Company

Euroledger is building a user activation tool for marketplaces, enhancing trust between their users by facilitating transfer of their reputational data from other platforms in a verified way.

2.5.2 Prototype solution

The user credentials, related to the users' accounts on platforms B, C and D, are stored in the user's wallet with identifiers and schemes sitting in the Verifiable Data Registry. The credentials are transferred from the wallet to platform A on demand and upon permission from the user. Platform A verifies identifiers and schemas with the Registry. Digital Identity is using a custom build blockchain system – Aries technology (built on Hyperledger Indy).

The solution is pluggable to any software architecture – the plugin is a generic, light-touch component. From the regulatory perspective, the solution is GDPR compliant and adheres to the W3C standard (Verifiable Credentials Data Model).

2.5.3 Technical development during Prototype stage

The prototype was fully built and tested in a controlled environment during BlockStart. Here is a video of a demo showing this prototype in action: www.youtube.com/watch?v=vnaCwqGZrWg&feature=emb_title

2.5.4 Business development during Prototype stage

During BlockStart, the commercial product was developed, and the size of the market was estimated. Four-year detailed financial model was built. Business development was started and resulted in acquiring 5 prospective adopters from an initial pool of 65 potential customers.

2.5.5 Testimonial

"Euroledger's journey with Blockstart was about building a prototype and a business model. Blockstart added value by checking for inconsistencies, typos and other irregularities in the reports and presentations, providing feedback of general nature and advising on specific Horizon 2020 rules and procedures."

Geomina Richardson, CEO and Business Analyst, EuroLedger Solutions

2.5.6 Public profile

This and further information is publicly available on the following webpage on BlockStart's website:

www.blockstart.eu/portfolio/euroledger/

2.6 Infidia

2.6.1 Company

Infidia's mission is to support small, both ethical and fast-growing businesses, providing them seamless financing.

The company believes that financing should be accessible to every ethical company, regardless of its current size. To do so, Infidia creates value for SMEs (liquidity and growth) and financial institutions (risk-free and scalable fees). Since it chooses only ethical and sustainable businesses as its clients, it helps companies that do good for the world.

2.6.2 Prototype solution

Infidia is the unique blockchain-based solution that keeps records of the business process preceding invoice creation. In both web and mobile apps, Infidia verifies invoices for invoice financing, otherwise not available for small businesses, unable to solve liquidity and (or) fund

their growth.

Due to the previous work experience, and a history of selling into this industry, the company beachhead

market consists of small manufacturing and distribution businesses. For these companies, it offers a productivity app that tracks business processes. While using these tools in everyday activities, users create hard and soft proofs that, by utilizing blockchain, serve as indisputable proof for invoice financing. In the sales productivity app, all features come from sales reps' recommendations and testing. In this case, Infidia offers an added value in process automatization while the primary benefit is in the invoice financing "on demand."

Moreover, Infidia is perfect for invoice financing for small transactions, otherwise unprofitable for banks. Due to its scalability, Infidia is tapping into the large portion of the 2,65 trillion-euro market of available invoices.

Infidia has a chance to support ethical and sustainable businesses, doing good for the world and the economy.

Here is a video explaining Infidia's solution: https://vimeo.com/397695388

2.6.3 Technical development during Prototype stage

- The main technical milestone was building a blockchain backend (one of the co-founders is R3 Corda certified developer), which covers the current and future technological needs of Infidia. Due to its model of tracking the complete business process, Infidia targeted companies with complex operations (manufacturers, producers, & distributors). From the technical point of view of interactions with its users, Infidia's key challenge is that many clients already use specific accounting tools to create invoices and order management tools. Infidia has decided

to solve this by creating an interoperability feature to connect its solution to their existing tools, to extract the data it needs to get the 360-degree data inputs necessary to get the invoice financing. Infidia concluded that the most scalable model to achieve this was to use the sales productivity software. Thus, the Infidia prototype consists of both a mobile and web app that verifies that the invoice was created between two parties. By getting data from software in this way, the company ensures that the invoice that has been created is valid and timestamped before sending it to the financial institution. Also, this approach is setting the risk of doing double spending to the minimal value.

- In the next 12 months, the company will fine-tuning Infidia (modular APIs connections and it plans to improve the identity and business process management based on SSIF Enabler and implementing Trusted Negotiations Enabler). From the crucial building fundamental grounds, the company is envisioning Infidia to be a fully quantum-resistant blockchain solution. R3 Corda is one of the most agile "cryptographically" full solutions that is offering SPHINCS-256, which is a quantum-resistant algorithm, with constriction and security based on hash functions.

- Other features that should be implemented are novel machine learning algorithms that will help Infidia for additional data insights and predictions that will benefit both SMEs and financial institutions.

2.6.4 Business development during Prototype stage

- Since the very beginning, the idea was that Infidia's primary revenue comes from the invoice financing fees. During the past six months, its business model was evolving in phases to capture more value in the long run.
  - Freemium Model – the service is free for a specified period while charging the company's sales productivity tool customization
  - Subscription Model – a monthly subscription model for companies with a high volume of invoices (three packages in the pricing)
  - Funding Transaction Fee Model – a fee as a percentage of the financing approved

During the prototype phase and mentoring sessions, Infida developed two additional revenue models (one is a specific marketplace) that go hand in hand with invoice financing. These models are part of the business plan and the material provided for the company's future investors.

- To approach investors during the prototype stage, Infidia also created a pitch deck, RASD, and a budget. Besides the costs of running the business, the company included the future salaries of its core team members who provided their services in the past few months. The team is ten people strong (2 co-founders, four team members, two part-time, and two consultants), and it plans to hire one more software developer, one social media, and three sales associates. The company outreached to 1.800+ potential SME adopters, with 80+ personalized proposals, and getting in discussion with almost half of that number. As a result, eight companies accepted to become Infidia's testers, while 6 of these companies applied for the BlockStart SME adopters pool. Besides adopters, Infidia met a large number of potential investors and companies that could become its partners or users. Since the company was selected to participate in the Creative Destruction Lab Blockchain BootCamp, it was among international Startups and Silicon Valley investors.

- The team also participated in the ReCap 2020, where a renowned expert had pitch mentorship and pitched in front of angel investors (continued communication via email). Moreover, it participated in multiple webinars (such as The Future of Data Startups in Europe), Hackathon (EUvsVirus). Furthermore, it had many warm introductions to potential investors. Finally, Infidia is targeted and addressed by many Startup programmes and accelerators.

2.6.5 Technical development during Pilot stage

During the Pilot, Infidia concluded that most of its new users don't use any invoicing software. For this reason, its goal is to provide them free solutions to enhance their sales productivity. In exchange, the company's users shared their experience with the factoring process, documentation, and workflow. As a result, Infidia is developing a system of notifications that facilitates the factoring process. It is the most valuable input of the Pilot stage, as it is both improvement in the experience and the speed of the process.

In the future, the company is fine-tuning Infidia (modular APIs connections and the improvement of identity and business process management based on SSIF Enabler and implementation of Trusted Negotiations Enabler). Furthermore, it will include novel machine learning algorithms for additional data insights, and predictions.

Finally, the company envisioned Infidia to be a fully quantum-resistant blockchain solution. R3 Corda, a platform that helped the company immensely, is one of the most agile "cryptographically" full solutions that is offering SPHINCS-256, which is a quantum-resistant algorithm with constriction and security based on hash functions.

2.6.6 Business development during Pilot stage

During the Pilot phase, Infidia tested its solution and gained feedback from 5 companies. Moreover, it immediately included some of their suggestions for the web app interface and functionalities in its product roadmap. Therefore, by its testers' recommendation, the Infidia web app now has additional features that improve scalability. For example, users can send a batch of invoices as invoice financing requests. Another improvement that Infidia is developing is a unique system of notifications for the factoring process. Derived from the factoring process's identified mistake, Infidia is improving this process for its ten clients (BlockStart KPI).

With these improvements, Infidia is tapping into a large portion of the 2,87 trillion-euro factoring market and opening another eight trillion-euro market of invoices not used for invoice financing.

At this stage, 10+ people are working on Infidia: two co-founders, four team members, freelancers, and two consultants. In October, one more financial professional joined the company-s ranks, making Infidia proud as it validates the potential of the team. Moreover, as highly motivated and enthusiastic, Infidia sets an example for its future team members, regardless of their expertise.

Finally, Infidia became a member of additional programs and accelerators. As part of the R3 Corda ecosystem and venture development, the company was invited as speaker at the most significant blockchain conference this year – CordaCon 2020 – as in on the process of being connected to the

highest-ranking executives of leading banking institutions and blockchain-focused VC funds, that have shown an early interest in investing in Infidia.

2.6.7 Pilot stage implementation

Here is a video summarizing Infidia's pilot implementation:

www.youtube.com/watch?v=DeaAjGRO7vs

In BlockStart, Infidia implemented its Infidia app in 5 SME adopters:

Pilot no. 1 with Mlekara Petrov:

The use case of connection to their existing software for extracting the data to web app.

- Goals identified: business processes; communication model; invoicing process; business tools for integration.
- Goals defined: Detailed factoring process; steps to connect to their software (user & pass and API).
- Results: Real-time use of their existing software; Forwarded mails of the factoring process; Feedback on the use of the software.

Pilot no. 2 with Bizbaz (Beez & Toys):

Real example of the use of the Infidia Order in the retail stores.

- Goals identified: business processes; communication model; invoicing process; workflow.
- Goals defined: Use of Infidia Order app; use of the web app as a complete solution (no software to connect).
- Results: Real-time use mobile app; Information from the financial side; Feedback on the use of the software.

Pilot no. 3 with Leste:

Source of a game-changing idea of the system of notifications.

- Goals identified: business processes; communication model; invoicing process; workflow.
- Goals defined: Found the problem within detailed factoring process.
- Results: Notifications system as an outcome of the process; The main value of the Pilot phase comes from Leste as finding the specific area to improve and ability for factoring by factoring agency; Detailed documentation about the complete factoring process.

Pilot no. 4 with mBrainTrain:

Evaluation of the specific KPIs and the approach to the banks

- Goals identified: business processes; communication model; invoicing process; business tools for integration.
- Goals defined: Detailed factoring process; steps to connect to their software (accountant connection).
- Results: Specific KPIs as the great input and review; CFO's feedback on the use of the software.

Pilot no. 5 with Marsben:

Use case of the connection to the software solution used by many freelancers.

- Goals identified:business processes;communication model; invoicing process; business tools for integration.
- Goals defined: Steps to connect to their software (user data, screenshots and API).
- Results: Possible connection to the large number of users of the frame.io; Feedback on the use of the software.

2.6.8 Testimonial

"Infidia is a Startup built on a sound foundation, made of entrepreneurial literature but also from years of "trial and error" learning. Those who followed this path know how hard it is, and that can also lead astray. Especially those that use "Youtube recommendations" as the knowledge source make typical errors by being prone to the survival bias. BlockStart helped Infidia to overcome these reasons that are causing many startups to fail. Having KPIs to meet and a mentor that advises and oversees proved to be of the highest value for our type of endeavour. It is because an incentive to structure the product, and then move fast to acquire users to test and give feedback is the only way up. Therefore, besides support by funding, the added value of BlockStart is of immense importance when building a product."

Dimitar Anastasovski, CTO, Infidia

2.6.9 Public profile

This and further information is publicly available on the following webpage on BlockStart's website:

www.blockstart.eu/portfolio/infidia/

2.7 Inova DE

2.7.1 Company

Inova aims to solve issues of provenance, transparency, traceability and trust present in both agri-food and in logistics. IoT platforms for digitalization of agriculture production are readily available, as is transport data (routes and temperatures) related to food goods stored by logistic companies. The PlugThings platform will assist in the data integration and provide an added-value with printable reports of food traceability; from production to end-consumer delivery.

Inova's proposed solution will facilitate checking the conditions in which the fruits, vegetables and animal products are produced and supply this data as an Ethereum ledger. By implementing the right APIs to leverage the authorized access to that data, the interested parties (such as producers, import customs, distributors, traders, buyers and regulators) can gain an unprecedented level of transparency that enables an effective traceability. The IoT data is kept verifiable safe and un-compromised, fostering trust in the value chain.

2.7.2 Prototype solution

Inova DE has developed an IoT platform for Industry 4.0, which has capacities for traceability for cross industries. One of the verticals it now applies this technology to is in agroofood. With IoT sensors from production, logistics, processing and delivery of food products, it can seamlessly generate traceability reports for different product lots. The Blockchain implementation facilitates the data exchange between Inova DE's platform and third-party platforms, as well as the secure and trusted access to lot data across the company's users.

2.7.3 Technical development during Prototype stage

Inova DE has implemented the smart contracts from its platform and validated the secure exchange of data between users. Now it is possible to generate reports from its own production and aggregate data from past producers.

2.7.4 Business development during Prototype stage

The company increased the knowledge about the competition and different approaches towards solving traceability. This helped them structure their go-to-market approach. For one, the presentation of Inova DE's platform in the different verticals is fundamental, as well as structuring public information about it. As it does not target a Platform-as-a-Service approach, but rather Traceability-as-a-Service, the company needs to change its approach before boarding the marketing efforts.

Inova DE met several potential adopters during this process and understood better their concerns and pain points: Usability is a key point.

It had no meetings with investors yet.

2.7.5 Testimonial

"The process was exciting, from pitching the concept to develop the solution we were engaged from beginning to the end. The expert considerations really helped to put focus on our strengths and to compensate for our weaknesses."

Vitor Vieira, Co-founder and head of office, Inova DE

2.7.6 Public profile

This and further information is publicly available on the following webpage on BlockStart's website:

www.blockstart.eu/portfolio/inova/

2.8 Kedeon

2.8.1 Company

Kedeon makes grocery delivery more secure, transparent and trusted. It provides a solution that protects the brand image and reputation of the delivery services and helps to boost consumer trust and confidence. It helps to prevent the major health risks from food spoilage that are caused by cold chain temperature breaches during the last-mile delivery of perishable food products. The platform allows grocery delivery services to utilize purpose-built IoT sensors that enable real-time monitoring and alerts, as well as to provide transparent delivery information to consumers.

2.8.2 Prototype solution

Kedeon provides transparent monitoring of last-mile delivery for groceries and food. Utilizing easy to implement hardware IoT modules that require little to no changes in the existing operations and minimal training. It allows to protect the company and reassures end-consumers. Its purpose-built platform works with existing workflow of companies and delivery personnel. By also enabling end-consumers to see transparent information they are reassured about the safety of grocery delivery services and this can be used for the publicity and marketing of the service (standing out from the competition).

Moreover, blockchain recording ensures data verifiability and enables to better prove liability in the case of breaches.

2.8.3 Technical development during Prototype stage

During the BlockStart programme, Kedeon developed a prototype of the new hardware temperature sensor units for the requirements of last-mile delivery services.

This includes battery-powered operation, the possibility to include other sensors, LTE-M/NB-IoT internet connectivity, and seed generation on the device for immutable data recording, as well as the successful deployment of smart contracts on Ethereum testnet.

Moreover, a Web3.js-based dashboard was developed to the needs identified during customer interviews, as well as a prototype of the end-consumer verification platform.

2.8.4 Business development during Prototype stage

During the BlockStart programme, Kedeon reached out to more than 35 SMEs in Latvia, and as a result, started the on-boarding of 5 interested companies. Now, with the help of BlockStart, the team is looking to expand its operations to other European countries.

2.8.5 Pilot stage implementation

Here is a video summarizing Kedeon's pilot implementation:

www.youtube.com/watch?v=OL3O_f_4_bY

In BlockStart, Kedeon implemented its "Last-mile delivery monitoring" product in 5 SME adopters:

Pilot no. 1 with "A-birojs":

Monitoring of B2B food product deliveries and B2C grocery deliveries.

Courier app used by 2 couriers; Over 75 deliveries monitored; Provided feedback about dashboard functionality.

Pilot no. 2 with "Kaleda":

Monitoring of B2C grocery deliveries.

Courier app used by 3 couriers; Over 50 deliveries monitored; Provided feedback about HW functionality.

Pilot no. 3 with "BLUE CIRCLE":

Monitoring of fresh fish wholesale deliveries.

Provided feedback about changes to HW casing for use with fish deliveries.

Pilot no. 4 with "Adazu desu darbnica":

Monitoring of meat product storage and deliveries to stores.

Over 150h of monitoring; more than 5 deliveries monitored; Provided feedback about stationary use of sensors.

Pilot no. 5 with "Piegade69":

Monitoring of perishable and sensitive last-mile deliveries conducted for other companies.

Courier app used by 4 couriers; Over 100 deliveries monitored; Provided feedback about courier app UX.

2.8.6 Testimonial

"The BlockStart programme helped us to find the perfect target customer segment for our product, validate our technology, and test it with European SMEs. Our assigned mentor was a great help along the way, guiding us through all necessary documents and deliverables, making it a much more enjoyable experience."

Reinis Skorovs, Founder/CEO, Kedeon

2.8.7 Public profile

This and further information is publicly available on the following webpage on BlockStart's website:

www.blockstart.eu/portfolio/kedeon/

2.9 REXS.IO

2.9.1 Company

Rexs.io is a data trust company offering a blockchain-based digital notarization service that creates a shield of trust for any data, including IoT streams, live video feeds, documents, images, and more. Organizations can benefit from the security and immutability of the distributed ledgers without their inherent bottlenecks and prohibitive storage costs. Rexs.io's core technology is scalable and affordable without compromising security.

Rexs.io goes beyond data security, and the user experience is back in focus. It abstracts the technical complexities and nuances of the DLT ecosystem with intuitive user interfaces. By design, Rexs.io is technology-agnostic and privacy-centric. We provide a framework with the freedom to choose and deploy the most suitable stack, rather than forcing a user to utilize a particular blockchain or a storage solution.

Here is a video presenting REXS.IO: https://www.youtube.com/watch?v=cmQtDV7ftlI&feature=emb_logo

2.9.2 Prototype solution

Rexs.io is a technology stack for DLT-based notarization of existing data and data ingestion streams with a clear decoupling of trust and persistence layers. Organizations can, therefore, benefit from the immutability and tamper-resistance of the distributed ledgers without data throughput limitations typical of permissionless DLTs.

Rexs.io has a modular architecture with standardized APIs between its core services. This simplifies the process of plugging in new components that can:

- provide interfaces to different storage systems,
- facilitate connectivity with different DLTs, and
- provide support for various data producers.

Rexs.io can be plugged into existing infrastructures without significant changes, limiting the time and cost of implementation.

Rexs.io abstracts the technical complexities and nuances of the DLT ecosystem in order to help with the onboarding of the rest of the world. The company's solution is built with intuitive user interfaces and an end-to-end chain of trust and scalability in mind. By design, Rexs.io is technology agnostic. It provides a framework with the freedom to choose and deploy the most suitable stack, rather than forcing a user to utilize a particular blockchain or a storage solution.

2.9.3 Technical development during Prototype stage

Rexs.io's prototype developed in BlockStart includes both software (SW) and hardware (HW) components:

1. SW components

- Control Center: The web-based frontend and administrative console for hardware provisioning, hardware pool management, service deployment/monitoring, and dashboards. Deployed as a SaaS solution.
- Secretary: Data proxy. It exposes an interface compatible with the existing target storage to serve as the new target for the data producer. Data sent to the Secretary is automatically hashed, the file is proxied to the storage system and the hash including file name is provided to the Notary component.
- Notary: DLT gateway. Notary interacts with the hardware wallet, signs the transactions, and sends the file name and file hash to the smart contract deployed on the blockchain to create the trust layer. The notary is accompanied by additional services facilitating robustness, high availability and cost effectiveness of our approach in a public DLT context. These include (a) secure message queue to mitigate data loss due to potential transaction backpressure from the network and (b) secure journal to balance the network cost in the context of potentially high velocity, high volume data traffic. Secure communication between components is supported by Public Key Infrastructure and TLS encryption.

2. HW components

Currently supported one is Infineon's Blockchain Security 2 Go smart card. It facilitates user-friendly and intuitive experience while interacting with a blockchain.

The prototype has been developed for CCTV camera live stream, however, it needs to be emphasized that it does not matter what kind of data input device will be connected. The company has decided to use the camera as an input device because it is easy to show that the stream is notarized live, almost parallelly to the video being recorded.

2.9.4 Business development during Prototype stage

The history of rexs.io goes back to March 2018, when the DAC team presented R&D results at the 2nd Productive4.0 Consortium Conference and Workshops in Budapest. The company has been working on DLT applications in Productive4.0 project, where 109 partners from 19 countries worked together to examine methods, concepts, and technologies for service-oriented architecture and electronic components for the Industrial Internet of Things. EUR 106 million is the total project budget. Almost half of it is funded, partly by the EU, partly by ECSEL Joint Undertaking and the national authorities of involved countries. The project ended at the end of April 2020. (Grant agreement No 737459.)

The Business Platform designed and implemented by Rexs.io's team was meant as an interoperability platform (technological stack) that can be used to support information sharing in the multi-stakeholder environment of the digital industry. The platform supported data provenance monitoring through external blockchain signatures.

Thanks to decoupling of data and trust facilitated by DLT based data notarization, all data packets fed by IoT devices are stored off-chain while the hash-value of a package is stored on a distributed ledger. The hash of data is, therefore, an immutable reference enabling identification of any changes in data stored in off-chain storage.

Diffusion 2019 was a two-day event focusing on the practical application of open-source distributed ledger technology, smart contracts, machine learning, and programmable tokens, to create a new data layer. Alongside hacking, contestants participated in workshops, panels, and expert-led fireside chats on the latest trends in enterprise & blockchain, token economics, interoperability, deep learning & AI, and more. Over five hundred programmers in 10 tracks competed against each other in the Diffusion 2019 hackathon. 45 teams made it through the weekend and presented their projects to judges on Sunday afternoon. It took our team 36h to build an award-winning application.

The goal was to create an intuitive, low-cost, non-intrusive demonstrator capable of efficiently tackling high velocity, high volume video and data stream, and storage inefficiency of the Ethereum Network. Rexs.io's team was awarded the first prize in 2 tracks:

- Web 2.5: onboarding the rest of the world to decentralized technology,
- Sharing in Consortia Networks: permissioned, tokenized data sharing with T-Labs, and Bronze Runner-Up prize in the general classification

In March 2020, rexs.io's team was accepted to Reno InNEVator Technology Accelerator in Nevada, US. The acceleration process focused on providing participants opportunities to present projects in front of American investors. The stay in the US also brought additional value, which was several contacts to companies potentially interested in blockchain adoption, however, the stage of project development was too early back then. Thanks to the BlockStart programme, the company was able to bring its project to the next level as BlockStart helped Rexs.io with reaching potential clients and partners globally

Rexs.io was accepted to be part of the third cohort of Base Camp Virtual organized by Outlier Ventures. Along with a group of 10 companies (from Canada, Europe, Asia, Australia), the company will be working on boosting our business development

2.9.5 Pilot stage implementation

In BlockStart, Rexs.io implemented its blockchain-based solution in 3 SME adopters:

Pilot no. 1 with ELDRO TECHNOLOGIE:

Authentication tool for a road infrastructure maintenance

Pilot implementation: Work evidence authentication. With their mobile devices, maintenance crews can send images to document the servicing job. The images are sent directly to the infrastructure operator, and their hash is notarized on the blockchain. In case of a dispute, all involved parties will be able to validate the attachments.

Main goals and results: Rexs.io was plugged into a test pipeline processing image evidence submitted by Eldro Maintenance workers. Sample single data object was successfully notarized with Rexs.io on a Ethereum Testnet. Performance impact of data transfer with and without Rexs.io notarization is less than 10% (single large file). Performance impact of data transfer with and without Rexs.io notarization is less than 10% (multiple small files).

Pilot no. 2 with Latitudo40:

Image validation solution for insurance business

Pilot implementation: Space imagery authentication. With Distributed Ledger Technology, we add a trust layer on top of satellite imagery serving as input data for Latitudo40 product – EarthAlytics. Thanks to DLT implementation, platform users will always be able to verify if the information provided is generated from a sound and trustworthy source.

Main goals and results: Rexs.io was plugged into a test pipeline. Sample single data object successfully notarized with Rexs.io on a Ethereum Testnet. Performance impact of data transfer with and without Rexs.io notarization is less than 10% (single large file). Performance impact of data transfer with and without Rexs.io notarization is less than 10% (multiple small files).

Pilot no. 3 with Vawlt:

Cloud Storage Authentication for any business

Pilot implementation: A full integration of Rexs.io notarization technology with Vawlt secure multi-cloud storage. This integration creates a solution that ensures end-to-end data integrity, from the notarization process to the storage in multiple clouds.

Main goals and results: Rexs.io plugged into a test pipeline. Sample single data object successfully notarized with Rexs.io on a Ethereum Testnet. Performance impact of data transfer with and without Rexs.io notarization is less than 10% (single large file). Performance impact of data transfer with and without Rexs.io notarization is less than 10% (multiple small files).

2.9.6 Testimonial

"Our participation in BlockStart programme brings the opportunity to get feedback and insights from the European blockchain industry. We feel like we are getting one step closer to our potential customers, thanks to the programme."

Agata Kukwa, Head of Communications, Rexs.io

2.9.7 Public profile

This and further information is publicly available on the following webpage on BlockStart's website:

www.blockstart.eu/portfolio/rexsio/

2.10 Xylene

2.10.1 Company

Xylene works with companies in the coffee, cocoa, timber, minerals and cotton industries that act as importers and producers, giving them transparency and control over their supply chain. This innovative approach combines supply chain management with satellite technology (SatNav and SatEO) and blockchain to create supply chain transparency.

This is achieved through supply chain visualisation and offers central companies an overview of where suppliers are located and where material is sourced from and allows for decisions based on risk assessment. Furthermore, physical products are labelled and tracked along the supply chain from the source to the consumer through our mobile application. Information connected to the product is passed between stakeholders and its authenticity is validated through satellite data and blockchain. Creating added value by being able to connect the journey of a product to the point of sale. The consumer will also be able to connect to the origin of the product, support sustainable projects, balance its carbon footprint and/or recycle the raw materials present in its product at the end of its life.

2.10.2 Prototype solution

Xylene is creating a transparent supply chain for SME adopters where essential steps of the material journey are tracked to deliver the best possible product to consumers. With the development, consumers will have the opportunity to experience the origin of the products themselves and connect to the community to interact with farmers in the country of origin. As part of the prototyping stage, the company significantly developed its traceability app and tested it with SME adopters in the field. This helped them to validate the user experience and begin with software development to achieve the successful pilot testing with real products.

Xylene's solution works in three steps:

- Supply Chain Mapping & Risk Assessment through a web dashboard: visualising the supply chain offers central companies not only an overview of where suppliers are located and where material is sourced from, it also allows for decisions based on risk assessment.
- Product Flow Tracking through the mobile application: physical products are labelled and tracked along the supply chain from the source to the consumer. Information is connected to the product; it is passed between stakeholders using blockchain and its authenticity is validated through satellite data.
- Customer Engagement on the final product: being able to connect the journey of a product to the point of sales leads to added value of the final product. The consumer will also be able to connect to the origin of the product, support sustainable projects, balance its carbon footprint and/or recycle the raw materials present in its product at the end of its life.

2.10.3 Technical development during Prototype stage

For the prototyping phase of BlockStart Xylene set technical milestones around the product development by giving priority to the mobile application and the data layer component to enable traceability of product flows at SME adopters. For this it was critical to get a detailed understanding of the current structure of the supply chain at its SME adopter and the target which shall be achieved with the final implementation. Based on this, the development of the user experience was performed. As the mobile application is used by suppliers of SME adopters the user experience had to be intuitive and perform without disrupting current processes.

The early interaction of potential adopters, through short iterative testing cycles, was decisive in the successful development of both UX and UI for the mobile app.

In parallel, Xylene began the development of the backend structure including the blockchain. For this a simulation was created which stores transaction on a permissioned blockchain. User-friendliness and data privacy were key factors defining and measuring the success of this milestone.

Next steps in the development are the web dashboard and the fine tuning and integration of the blockchain layer in the final product. Furthermore, Xylene will continue conducting multiple pilot projects in order to collect more user requirements and most importantly identify features common to different targeted markets. Based on these requirements a standard scalable product ready for market uptake is planned to be achieved in the next 12 months.

2.10.4 Business development during Prototype stage

During the prototype phase of BlockStart business development efforts were mainly targeted towards strengthening the business and market strategy and creating an investment pipeline with a strong pitch.

Xylene created an in-depth competitive analysis and started initial efforts at developing a pricing strategy for the final SaaS product.

Together with the support of their mentor, the company performed a market positioning and began concentrated sales activities. During the prototype period it presented the pilot project to several potential customers in virtual meetings and managed to sign a pilot customer in the coffee industry, with two further SME's interested and signing commitment letters. During these customer

presentations, Xylene used the opportunity to validate its market fit and get a strong feedback on the need of its customers.

As the company is targeting pre-seed investment, it has been very active pitching its startup to angel investors. Investment will enable them to hire additional team members for software development and sales to accelerate the development of the pilot projects.

2.10.5 Testimonial

"The BlockStart programme has been a great experience for us as a startup. The management has been very professional, and the organisation and communication has been very open and upfront. The prototype phase has given us the opportunity to develop our product and service in a customer-centric way while offering us expert support and guidance in the journey. From setting the targets for development and realisation to coordinating the approach for customer tests and investor pitches the mentoring has been at the highest level and with great enthusiasm. The virtual presentation and selection events have been engaging even though no personal meetings were possible. Overall, the prototype phase was a success for us, and we would recommend BlockStart to any Blockchain developer startup."

Christopher Edwards, Co-Founder / CEO, Xylene

2.10.6 Public profile

This and further information is publicly available on the following webpage on BlockStart's website:

www.blockstart.eu/portfolio/xylene/