



BLOCK START

D4.3: BlockStart DLT solutions portfolio – 3rd version

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1. Introduction

This report compiles the DLT solutions developed in BlockStart's open call #3 Prototype and Pilot stages, which took place from August 2021 until February 2022.

The Prototype stage included 10 teams (AgeVolt, BlockFrauds, Blockpulse, BlockTac, Blue Room Innovation, Comunitaria, Digital Village, HODLNG, HOPU, SHIPNEXT).

6 of those teams (AgeVolt, BlockFrauds, BlockTac, Comunitaria, Digital Village, HOPU) were selected to the Pilot stage, implementing their solutions in 21 [end-user SMEs](#).

The 10 DLT solutions developed in BlockStart's open call #1 are showcased both in this [report](#) (included in the [Deliverables](#) section of our website), and under section [Our Startup Developers](#) from BlockStart's website.

The 10 DLT solutions developed in BlockStart's open call #2 are showcased both in this [report](#) (included in the [Deliverables](#) section of our website), and under section [Our Startup Developers](#) from BlockStart's website.

2. DLT solutions portfolio

2.1 AgeVolt

2.1.1 Company

Our vision is to accelerate vehicle transition by making charging accessible and convenient whilst achieving optimal energy distribution. Our mission is to create a comprehensive EV charging digital ecosystem for open collaboration and contribute towards climate action.

2.1.2 Prototype solution

The specific objective of the prototype is to bring a new blockchain solution for creating a “White Label Loyalty Tokens” for the owners of EV Charging Points (EVCP). This will allow EVCP owners in AgeVolt charging ecosystem to create and generate a branded loyalty token and assign it to a specific customer or employee ID as a key to specific conditions when charging the EV.

2.1.3 Technical development during Prototype stage

During the development of AgeVolt Loyalty Token, the following technical developments have taken place:

The first most important milestone was to run our Blockchain network and to be able to deploy smart contracts to our freshly setup network. Prototype is based on Hyperledger Besu blockchain network. Currently, it is a private permissioned network with Proof of Authority consensus mechanism; with 4 validators in our network with open possibility or option for joining our future partners as additional validators in our network to ensure the network decentralization. The “White Label Loyalty Tokens” implementation is based on Ethereum community standards (modified ERC-20 standard).

Key features and functionalities:

Dashboard Analytics – The Customer (AgeVolt customer from hospitality business) is able to see basic token transaction analytics

Tokens – The Customer is able to setup a token specific for their business defining token name, ticker, description, logo and most importantly the price coefficient

EV Fleet management – The Customer is able to assign the number of tokens to a specific employee using employees email address

Code Printing – The Customer is able to generate PDF version of QR code, containing the defined amount of loyalty tokens for their customers

Direct Token Minting – The Customer is able to mint tokens directly to their customers using customer email.

API – Customer is able to connect their loyalty system or receipt printer with AgeVolt platform and directly with their on-going marketing campaigns along with other functionalities.

Prototype functionalities and improvements have been implemented iteratively following every interview with potential SME adopter. Since our focus is to build the great EV charging solution and digital products, our duty was to listen to the customers and mix it with inspiration from existing loyalty marketing solutions and bring it into EV charging ecosystem. We conducted interviews with the 13 potential SME adopters, which resulted in enhancements functionality for example functionality to define the conversion rate between tokens and kWh of energy. In the original version, we wanted to implement 2 types of tokens – tokens for free charging and tokens for discounted charging. SME adopter feedback resulted in creating only one type of token with implemented coefficient that is defining the price rate between kWh of energy and average expenses.

2.1.4 Business development during Prototype stage

During the development of AgeVolt Loyalty Token, the following business developments have taken place:

We ran a digital marketing campaign on social networks, including BlockStart to find the appropriate SME adopters. We were looking for the SMEs from Slovakia and Czechia for the logistics reasons of EV charger installation. The campaign was run by team of 6 members from AgeVolt digital marketing, sales and BlockStart team in September & October 2021. Following the campaign we had interest from 13 interested and eligible companies from Slovakia.

Sales and BlockStart team established the process of contacting and interviewing each company. Process ended with a shortlist drawn of 4 eligible SME adopters who have since applied for the Blockstart programme.

The remaining 9 eligible companies, whilst were not interested in Blockstart programme, have however expressed interest in AgeVolt's EV charging solution and our sales team is in the process of completing sales orders.

We also had interest from 3 non-eligible companies from retail and post office for implementation of this solution for Q1-Q2 2022.

Hirings

In time of starting the prototype stage we took the opportunity to hire additional team member, capable of being initiated into blockchain technology – Jakub – junior blockchain developer. Prototype stage been a good opportunity not only for us but also for our new junior developer to try hands-on blockchain technology and see it in action and all advantages for the future.

In next 6 months we are planning to expand our team – currently our team setup is – two backend developers, one frontend developer and blockchain development lead together with blockchain junior developer. We are strong in backend development but our future hirings will be focused on frontend development and infrastructure administrators.

2.1.5 Pilot stage implementation

In BlockStart, AgeVolt implemented its "AgeVolt Loyalty Management Token" product in 3 SME adopters:

Pilot no. 1 with Maravar:

Hospitality business – especially case of Penzion (guest-house) Mara – is ideal case for implementation of loyalty token solution. Our client has access to the loyalty portal, where he can manage his own loyalty tokens, assign tokens directly to his customers or create his own fleet of EV drivers with assigned balance of tokens. After minting, these tokens are assigned to user wallets in portal.agevolt.com web application, where users/customers are able to use these tokens in exchange for the charging of their EV's. Loyalty tokens play the role of literally being the loyalty points that customers can exchange for charging of their E-vehicles and as well as the motivation to come back and visit the hotel again.

The main goal of this pilot solution was not only development and real-life test of loyalty portal and loyalty token solution, but the implementation of loyalty token as a payment solution on AgeVolt Portal – the web portal for EV charging and successful process from minting tokens directly to user wallet to using it as a payment method, when charging the electric vehicle. The main takeover was the satisfaction of SME adopter and fruitful discussion with ideas for improvement and cooperation into the future.

Pilot no. 2 with Letmellor - Spillenberg House:

Spillenberg House is an interesting use case for a loyalty token solution. This client is renovating one of the oldest houses in central EU and this was a great opportunity to create synergy between the history and present technologies – the historical building and EV charging solution of the future. This house will be serving as a multifunctional building hosting cafes, restaurants, and offices, therefore this is the place where rentiers can charge their EV's and use loyalty tokens of Spillenberg House in exchange for a charging on daily basis.

The main goal of this pilot solution was not only development and real-life test of loyalty portal and loyalty token solution but the implementation of loyalty token as a payment solution on AgeVolt Portal – the web portal for EV charging and successful process from minting tokens directly to user wallet to using it as a payment method when charging the electric vehicle. The main takeover was the satisfaction of SME adopter and fruitful discussion with ideas for improvement and cooperation into the future.

Pilot no. 3 with Villa Severka:

Hospitality business – exactly the same case as with Penzion Mara – this is another ideal case for implementation of loyalty token solution. Our client has access to the loyalty portal where he can manage his own loyalty token, assign tokens directly to his customers or create his own fleet of EV drivers with assigned balance of tokens. After minting, this tokens are assigned to user wallets in portal.agevolt.com web application when users/customers are able to use this tokens in exchange for a charging of their EV's. Loyalty tokens plays the role of literally being the loyalty points that customers can exchange for charging of their vehicles and as well as the motivation to come back and visit the hotel again.

The main goal of this pilot solution was not only development and real-life test of loyalty portal and loyalty token solution but the implementation of loyalty token as a payment solution on AgeVolt Portal – the web portal for EV charging and successful process from minting tokens directly to user wallet to

using it as a payment method when charging the electric vehicle. The main takeover was the satisfaction of SME adopter and fruitful discussion with ideas for improvement and cooperation into the future.

2.1.6 Testimonial

“Our experience of the Blockstart programme so far has been amazing. It provided AgeVolt’s team a unique opportunity to take a concept from an idea to the prototype stage. This enabled us to validate our hypotheses in the market and now we are ready to commence the Pilot project with the interceded SME adopters. Furthermore, we will launching the white label loyalty token in Q1 2022. The mentoring and guidance provided has been extremely beneficial to shape prototype development.”

PARAG GOGATE, Chief Revenue & Operations Officer, AgeVolt

2.1.7 Public profile

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

<https://www.blockstart.eu/portfolio/agevolt/>

2.2 BlockFrauds

2.2.1 Company

BlockFrauds helps insurers tackle insurance fraud more efficiently and effectively, helping cut \$billions of costs that result in higher premiums which prevent the most vulnerable people getting their protection. Cutting edge technologies including AI and proprietary algorithms help detect fraud, and private blockchain is used to share the anonymised intelligence seamlessly and compliantly, like a Fraud Bureau, to spot fraudsters and multiple claims whilst the AI learns faster and more widely.

2.2.2 Prototype solution

Insurance fraud is a massive issue: >\$40bn per year in US Property & Casualty alone, passed on as higher premiums meaning billions of the most vulnerable people worldwide cannot afford the protections they provide whilst everyone gets worse customer service due to the fraud checks.

BlockFrauds helps insurers detect fraud more efficiently and effectively, whether in automated systems or direct interactions. It helps form an ecosystem of the insurer’s chosen data and tools, for maximum detection opportunities. It applies cutting-edge technologies including AI and proprietary algorithms to further detect fraud. The anonymised intelligence is then shared seamlessly and compliantly on a private blockchain, acting like a Fraud Bureau. Frauds, fraudsters and multiple claims are better detected whilst the AI learns faster and more broadly from the wider intelligence, helping it keep pace with fraudster evolution.

Insurance claims handlers get initial and updated Claim Credibility Scores and Claimant Reputational Scores to help prioritise their investigations. All insurers can benefit, including SMEs who don't have the advantage of large proprietary datasets for cross-checks, whilst end customers get better value and service with the chance of lower premiums and more innovative products.

2.2.3 Technical development during Prototype stage

During the development of BlockFrauds, the following technical developments have taken place:

The Corda sandpit has been built ready for pilot. Corda is the leading enterprise blockchain software, enabling the private permissioned access that ensures only trusted participants can contribute intelligence and train the model.

The solution has been designed to facilitate connectivity, with APIs easily created alongside the potential for related AI. Private nodes are scoped on AWS.

Two initial fraud detection solutions have been developed for the pilot. Digital Speech DNA detects any suspicious changes in speech, or speech characteristic of fraudsters. Frequency and modulation analysis helps voice recognition and any changes, whilst text mining such as looking for a particular phrases or/and words using NLP (Natural Language Processing) to help review characteristics, and sentiment analysis to capture specific view. The results are anonymised algorithms which are unique to each person and each communication, enabling cross-checks. Digital Image DNA converts images to algorithms to check multiple use, even if inverted or filtered or showing the same subject from a different angle.

The Claim Credibility Score algorithm has been created, using 2 deep learning AI and 2 shallow learning ML.

The pilot will involve connecting to Claim Technology's platform to prove the functionality, start seeding the data and training the model. MVP development will then include scaling the Corda protocol, adding out-of-the-box connectivity and AI for additional popular links, training and enhancing the models, and determining any improved libraries and speech processing tools. Subsequent steps will expand the connectivity, further scale the protocol, and start introducing non-English European language capabilities. Nymiz will provide compliance support and scope future collaboration benefits.

2.2.4 Business development during Prototype stage

During the development of BlockFrauds, the following business developments have taken place:

BlockFrauds has received investment from CV Labs, part of the CV (Crypto Valley) VC family based in Zug, Switzerland, including participation in their incubator batch_03. This provides excellent support across a range of topics including blockchain, other technologies, markets, regulators, and practical advice, and is an excellent complement to its existing investor, Outlier Capital, and the BlockStart programme support.

BlockFrauds has also rebranded to reflect its focus on fraud detection, having previously partnered with a key industry player to take a different solution to MVP ready for multi-party trials in winter 2020/21.

During the prototype phase, extensive review of potential SME partners found many excellent candidates, eventually settling on two that were preferred for the pilot phase requirements. Claim Technology (UK) is a gateway platform providing simplified APIs, no-code design tools and an award-winning virtual agent app to help insurers more easily embed best-in-class insurtech solutions into their offering, both in the customer front end and behind-the-scenes processing. They are ideally placed to partner on the pilot and can provide marketing support and access to a wide range of their existing customers, including SMEs. Nymiz (Spain) are focused on compliance and can provide support in that area as well as exploring some identified collaboration benefits.

As well as the validation via Claim Technology, insurance sector contacts have also given strong support for the solution concept, with a plan to secure involvement in trials and data to seed and train the model at appropriate stages.

The updated go-to-market now assumes building on the pilot with Claim Technology for MVP launch on their platform, before extending the option for independent supply or routes such as other platforms or as a plug-in. The business model remains B2B SaaS. The pilot and initial trials are likely to be free, as the data is seeded, moving to pay-per-use as it becomes established, then more mature models such as monthly / annual licenses, value-sharing and services.

The business plan assumes team expansion as technical and financial milestones are met, including specific technical, fraud and customer-facing roles.

Marketing work will escalate during the pilot phase, following the rebrand. Soadad already spoke at CordaCon2021 on “Understanding the true value of DLT in insurance.” Events are being planned through CV, Outlier and Claim Technology as well as independently, and applications are being made to other accelerators and competitions.

2.2.5 Pilot stage implementation

In BlockStart, BlockFrauds implemented its “BlockFrauds” product in 2 SME adopters:

Pilot no. 1 with Claim Technology:

Install BlockFrauds onto Claim Technology platform and achieve suitable technical performance.

Test images and/or speech and achieve target fraud detection performances.

BlockFrauds is integrated on Claim Technology’s platform. Image functionality confirmed and met KPI targets. TRL7 achieved.

Claim Technology platform is now capable of handling voice data. Further integration testing is underway. Speech functions remain good off platform and meeting KPI targets.

Discussions entered with third party for speech trials.

Pilot no. 2 with Nymiz:

Discussion and opinion of BlockFrauds’ compliance with GDPR.

Note of any relevant factors differing between UK and Spain.

Discussion of possible Nymiz blockchain use-cases.

Opinion that the BlockFrauds appears compliant with GDPR (consistent with validation from independent UK lawyer), and wider discussion of common challenges.

No significant differences to Spain.

Possible Nymiz use-cases for blockchain discussed.

2.2.6 Testimonial

“BlockFrauds has had an amazing journey with BlockStart. It has been invaluable to plug into such an experienced and truly helpful group of mentors, on everything from technology and regulation to marketing and investment. BlockStart helped us find great growth opportunities with SMEs to complement the big enterprise segment, and the profile helped secure a great new investor. We even rebranded along the way!”

ROANNA DOE, Co-founder & CEO, BlockFrauds

2.2.7 Public profile

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

<https://www.blockstart.eu/portfolio/blockfrauds/>

2.3 Blockpulse

2.3.1 Company

Blockpulse is a tokenization based equity management platform. Through a unique legal and technical approach, our mission is to disrupt the way companies manage their operations and their shareholding today, to become the infrastructure of all the unlisted market tomorrow. By managing financials flows linked to the operations, we are able to handle the whole legal and financial aspects of the companies shareholding management in a fully digitalized and automated environment.

2.3.2 Prototype solution

The prototype is the continuation of our current software which aims to propose a full digitized legal infrastructure to handle tokenized shares lifecycle (issuance, management, transfers). The prototype is focus on the transfer part.

2.3.3 Technical development during Prototype stage

During the development of Blockpulse, the following technical developments have taken place:

We needed to comply with actual context of the company to understand the legal rules which applies to transfer of shares within a company. First task was to understand the context, second was to enable

any shareholder to propose its shares to sell by defining price and quantity. Third was to invite potential seller to onboard, kyc, accept offer, pay and sign related documentation. Fourth, was to notify issuer to take action on the deal and inform the issuer on the steps to comply with. Fifth, was to automate delivery vs payment of the transfer to delete risk of counterpart. Sixth was to automate reporting of such operation for the company (update of captable, register of shares).

2.3.4 Business development during Prototype stage

During the development of Blockpulse, the following business developments have taken place:

Integrate the pilot to our current product and to communicate on new possibilities to our current leads and clients.

We've launched several open calls on startups to address the use cases we were looking for and receive around 20 applications. The result of this open call was that capital incentive to drive community engagement was the winning use case in terms of demand.

Regarding our available band with for Blockstart, we decided to experiment this pilot with one startup having already a community of thousand engaged people (Flint Media). The pilot will enable to distribute equity as an engagement program within a year and let shareholders to buy/sell equity on the dedicated secondary market to materialize value of their engagement.

2.3.5 Testimonial

"BlockStart's program helped us to accelerate on a POC with some incentive for potential SME adopters. The BlockStart team was competent to challenge our goals with this POC along the program, I recommend!"

THIBAUT INGELAERE, CEO, Blockpulse

2.3.6 Public profile

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

<https://www.blockstart.eu/portfolio/blockpulse/>

2.4 BlockTac

2.4.1 Company

BlockTac is a factory of trust: BlockTac fights fake consumer products and data with our certificates and single-use digital seals registered with Blockchain technology, designed for brand protection and consumer engagement. And with our Blockchain-of-things devices, that communicate directly with IoT sensors, encrypt the data, and store it in a public Blockchain. The information now becomes trusted and traceable, impossible to change, truly linked to its source.

2.4.2 Prototype solution

Our devices are autonomous Single Board Controllers (SBC) that collect information directly from IoT sensors or machines, encrypt the data, and store it in a public Blockchain. The information now becomes trusted and traceable, impossible to change, truly linked to its source. Privacy is fully protected, and potential scammers are immediately identified. We name these edge computers “Blockchain-of-Things” devices. This approach makes it impossible for third parties to amend or impersonate the real producers of the data, therefore protecting the training of AI systems, and reducing energy consumption. Our competitive advantage is unique and based on the high computing power, low size, and cost of the SBCs, with full compatibility and functionalities.

To further increase the security of our IoT devices, we have implemented a decentralized Key Management System (KMS) also based on Blockchain technology. The goal is to store key sensitive data in a decentralized and encrypted manner outside the device.

Our software may be used by third-party IoT platforms or SBC developers and is easily deployed through the use of Docker and Kubernetes.

This solution will protect IoT platforms and AI systems against data poisoning from cyberattacks. It may be applied in many industries: Automotive, Energy, Healthcare, Smart manufacturing, Smart Retail, Smart Buildings, Smart Homes, and Smart Cities.

2.4.3 Technical development during Prototype stage

During the development of Blockchain of Things Devices, the following technical developments have taken place:

Hardware developments: We have been working on scaling down the SBC’s firmware to achieve a faster, real-time capability of processing, slicing out unnecessary Linux capabilities. We have been able to optimize the firmware to execute specific scripts, run fewer services, and achieve faster and real-time capability of processing. This is now a more versatile device capable of serving solutions adequate to different applications, especially to Smart cities and Industry 4.0. This optimization also avoids sending data to an intermediate server for processing before registering the data in Blockchain. We have tested the functionalities that we need to implement and operate our devices: installing Python, SQLite, MQTT (broker and client), SSH availability, Bluetooth... All functions are working now correctly. We have achieved even higher optimization than expected and in smaller but equally powerful devices. We have been able to install the programs and fulfil all the requirements.

Decentralized key management: To increase the security of our IoT devices, we have implemented a decentralized Key Management System (KMS) that also uses Blockchain technology. The goal is to store sensitive data in a decentralized and encrypted manner outside the device. This allows us not to have passwords, private keys, addresses, IPs... stored in the device and be well protected. In addition, we may give permissions to the devices and specify which devices can perform certain functions.

Deployment and working with Docker: Our software may be deployed with Docker and Kubernetes. Docker is an open-source project for the deployment of software or applications inside “containers”. This provides a layer or encapsulation. Everything needed is installed and run inside this container, without affecting other software installed on the device or machine. In addition, it is also useful for software maintenance and portability.

2.4.4 Business development during Prototype stage

During the development of Blockchain of Things Devices, the following business developments have taken place:

Participating in the program has helped us to focus our efforts on the SMEs' industries interested in the implementation of our solution: Smart cities and Smart Manufacturing. Accordingly, new materials and commercial presentations have been developed that will facilitate coming commercial activities in these industries.

The simultaneous opportunity of interacting with development teams specialized in IoT devices and Blockchain technology from the University of Arizona has allowed us to advance more quickly than expected in the optimization of the firmware of our devices and in the encrypting and registration processes of the data on the Blockchain. Some difficulties that would have taken longer to resolve in solitary have benefited from the cooperative work in an international context.

The companies interested in developing pilot projects with our devices are:

Atfield Technologies: Delivers solutions for the data-driven management of vineyards. Their platform combines advanced data modeling with tailor-made hardware to address the key challenges in sustainable viticulture.

Applied Research Solutions: Expertise in the industrial automation field, participating in projects in sectors such as oil and gas, automotive, food industry, chemical industry, urban utilities.

Advanced Microturbines: Manufacture autonomous microturbines for natural gas and water pipes. The microturbines for natural gas allow the real-time monitoring and control of gas networks reducing costs and CO2 emissions.

Qonteo: A data mining company using AI systems. Their solutions work in different industries: Accommodation and Food Services, Construction, Finance & Banking, Mining, Retail, Security, Smart Cities, Telecommunications, Tourism, Transportation.

We had the opportunity to carry out tests with data files of those companies. The encrypting, blockchain registration and verification processes have proven their viability. The mode of integration with their own devices or into their software platforms is part of the work to be developed in the pilot project phase.

From the go-to-market point of view, the introduction of any innovative and disruptive technology always faces the difficulties of capturing the attention of potential users. Participating in the BlockStart program has given us access to SMEs from different European countries, which can promote the faster implementation of pilot projects. This will contribute to greater visibility for our solution and will simplify the market entry processes. After the pilot project we will jointly enter in sales activities with partner SMSs in order to reach:

System Integrators (IBM, Accenture, Siemens)

Network Providers (Cisco, Verizon, Ericsson, AT&T)

Product Vendors (Eaton, Honeywell, ABB, Schneider, Siemens)

Service Providers (IBM, Serco, SAIC, Infosys)

2.4.5 Pilot stage implementation

In BlockStart, BlockTac implemented its “Blockchain of Things Devices” product in 3 SME adopters:

Pilot no. 1 with Advanced Microturbines:

Manufacture autonomous micro turbines for natural gas and water pipes. The microturbines for natural gas allow the real time monitoring and control of gas networks reducing costs and CO2 emissions. The microturbines for water allow the pressure monitoring and control, reducing water losses and pipe mechanical stress. Both elements use the energy of a water, gas or air pressure drop. This energy is captured by the microturbine and converted into electricity. The microturbine is composed of a micro expander integrated into an electric microgenerator and of the electronic control unit.

BlockTac devices attached to the microturbines would collect the data at the pipe source and register the information in Blockchain, providing the necessary protection and authentication for normal operation or decision-making purposes. This will prevent attacks similar to the one suffered by Colonial Pipeline in May this year.

Technical KPIs:

We sent to Advanced Microturbines the R-Pi 4 and they tested the connectivity with the IoT devices to secure the data.

The SME Adopter have been able to test the communication between two devices through MQTT with the IoT data that they want to protect and encrypt with Blockchain.

We also offered to the SME different ways to send data and communicate the devices given the adaptability that BoT-d

Business KPIs:

We are working with the SME to present the solution to 10 potentials customers on the market through a joint presentation.

In addition, we have created a short video explaining the Pilot and posts in social networks to make the solution known.

We aimed to continue the cooperation beyond the BlockStart Pilot Stage 4 months.

Pilot no. 2 with Atfield Technologies:

Delivers solutions for the data-driven management of vineyards. Their platform combines advanced data modeling with tailor-made hardware to address the key challenges in sustainable viticulture. Their sensors, easily installable, fully automated, wireless, and powered by solar energy, measure individual tracking of conditions at a configurable number of microsites.

BlockTac may collect all the information at the source and registered the data in Blockchain, providing the protection and authentication that their client will highly value. This can be done on our devices or updating or complementing the firmware of their own devices.

Technical KPIs:

The Pilot with Atfield Technologies has been tested the communication between a device or machine through HTTP using APIs, in order to write the data to Blockchain.

In addition, BlockTac has develop a solution to simulate the communication between a IoT device and R-Pi with MQTT without the R-Pi. The solution consists in sending the IoT data from the device in the same way that we will do if we would have a R-Pi in the field but running MQTT on a server.

Business KPIs:

We are working with the SME to present the solution to 10 potentials customers on the market through a joint presentation.

In addition, we have created a short video explaining the Pilot and posts in social networks to make the solution known.

We aimed to continue the cooperation beyond the BlockStart Pilot Stage 4 months.

Pilot no. 3 with Applied Research Solutions:

Expertise in the industrial automation field, participating in projects in sectors such as oil and gas, automotive, food industry, chemical industry, urban utilities. Also develops didactic equipment related to approved programs of study, considering the current technological level encountered in main industry sectors.

The portfolio includes didactic equipment for specific technical fields, integrated laboratories mainly for technical universities as well as for companies acting in the industry, training sessions for students or postgraduate courses for professionals in the industry.

Trustworthy validation of inputs and outputs of an industrial data science pipeline through the adoption of blockchain/DLT technologies:

- Input: Anti-tampering validation of the input datasets that might come from both trusted or unknown third parties.
- Output: Securing the prediction model structure and inference results against malicious actors across the analysis and processing chain

Technical KPIs:

The Pilot with Applied Research Solutions has been tested the communication between a device or machine through HTTP using APIs, in order to write the data to Blockchain.

Applied Research Solution has been able to secure the data that they used in machine learning models (AI) in order to validate the inputs and outputs of an industrial data science pipeline.

Business KPIs:

We are working with the SME to present the solution to 10 potential customers on the market through a joint presentation.

In addition, we have created a short video explaining the Pilot and posts in social networks to make the solution known.

We aimed to continue the cooperation beyond the BlockStart Pilot Stage 4 months.

2.4.6 Testimonial

“We faced two challenges at the start with our Blockchain-of-Things devices. The first had to do with the Deep Tech nature of our solution. Such innovation does not find an easy entry on the market and the prospect to interact with SMEs and to identify opportunities to implement Pilot projects had proved to be difficult. The second challenge was to select the best industries for a diligent market entry, given the crosswise nature of our solution.

As a result of our participation in the BlockStart program, we had the opportunity to meet SMEs interested in implementing our solution to add higher value to their offers and eager for a joint entry into specific industries. We have been able to improve our solution to better accommodate their needs and be ready to access the market in the following industries: Industry 4.0, Smart Cities, and Healthcare.”

FRANCISCO J. GUILLÉN MARTÍNEZ, CEO, BlockTac

2.4.7 Public profile

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

<https://www.blockstart.eu/portfolio/blocktac/>

2.5 Blue Room Innovation

2.5.1 Company

We are a young start-up focused on new technologies; our core team are high skilled developers specialized in blockchain. We have a proven track record on developing solutions using blockchain. We also have a strong relationship with the research Centre Easy of the University of Girona, leaders in Artificial Intelligence and blockchain’s research. We view technology as a fundamental enabler to achieve the sustainability goals of the Green Deal.

2.5.2 Prototype solution

Identity has been a pervasive issue in the art world for decades. Determining the authenticity of a piece of art is quite a challenge, and crucial, too, since the identity of the author often determines the price. Provenance is one of the most difficult aspects of the art world. NFTs raise even further doubts

about authenticity, because in the digital world, who can really tell who's behind the keyboard, or if the link to a particular internet address is the real piece, or a copy of it. The solution to this conundrum is the integration of NFTs with Self-sovereign identity (SSI). By linking NFTs with a digital ID, it becomes possible to trace any one art piece, and verify the piece's authenticity and legitimate author. Because SSI is built for blockchain-based identities, it is the perfect solution to bring identity to NFTs!

Our extension of the NFT ERC 721 – SCENTS – will solve some of these problems by providing a unique self-sovereign identity to each piece of art based on its real track record in expositions and its relevance for the audience which with SCENTS have the permanent bond with its favourite piece of art and stays connected to them independently of the property ensuring collectors are paying for the quality of the art which with its followers and lovers a part of the quality proof based on the fame of the artist. SCENTS fine tracks the exposure of pieces of art as a proof of value and as a ground for measuring exposure shares for creators and owners.

2.5.3 Technical development during Prototype stage

During the development of Blue Innovation Room, the following technical developments have taken place:

In our NFT extension, the artist creates a digital identity for each artwork. This identity is set into the NFT and under control of creator address. The artwork identity uses the W3C standard Decentralized Identifiers (DIDs) v1.0 that is resolved in a public DID document. This document contains a set of data describing the artwork including mechanisms, such as cryptographic public keys, that the artist can use to authenticate itself and prove its association with the DID.

The cryptographic public keys are also used to create the Verifiable credentials issued by exhibitors using the W3C standard Verifiable Credentials Data Model 1.0. At any time, the artist can collect the different credentials received and create a public credential presentation. This public presentation can be verified by anyone using the cryptographic public keys set in the public DID document.

The SCENTS platform provides the required tools for artist and exhibitors to control the artwork identities, create credentials and public representations.

With the web client, working as an encrypted wallet, the artist can create and control the digital identities. Our solution is interoperable, any identity provider could be used in our standard. For this pilot we use the kilt parachain network. All DID Documents and credentials proofs are stored in the polkadot blockchain.

To create NFT with our standard we provide a Metamask integration. Artists that have used NFT marketplaces will easily create NFT using our standard.

After BlockStart our future planned activities for the upcoming 12 months will be:

A5 – Development of the oracles for working with expositions, social media, and streaming. Make it decentralised oracles with WITNET.

A6- Tokenomics – create the SCENTS instrumental token SCT for the parachain and make it exchangeable and interoperable with ETH, DOT and other tokens through a UNISWAP 3 protocol to fuel the Witnet, Polkadot, Ethereum implementations. No tokens for ID but ID code will be incorporated.

2.5.4 Business development during Prototype stage

During the development of Blue Innovation Room, the following business developments have taken place:

Business model: to estimate our financial plan, we have fine-tuned our predictions according to the growth of the NFT sale market and the possibilities for expansion. Due to the uncertainty that still surrounds this market, we have forecast until 2027 in different scenarios: realistic, optimistic and pessimistic. For the calculations, only the realistic scenario has been taken into account, where we expect to have the first project income will come at the beginning of 2023 (once SCENTS reach TRL 9) 22,910 EUR and we estimate to reach 997,647 EUR by 2027, which it would mean having achieved 7% of the NFT sales market within the NFT segment.

Commercialisation strategy

Phase 1 (2022 – 2023): Once our solution will be successfully tested and piloted in small NFTs marketplaces and digital museums such as HDM and Art.Army – which we already have agreed pilot our solution and we will address to our direct ecosystem created during prototyping phase: ESAT and Baró Gallery have signed letters of Support.

Phase 2 (2023 – 2024): Once our solution will be consolidated in small platforms and SCENTS begins to be widely used in our close ecosystem, thus Early adopters have been achieved we will address our efforts to bigger players to cross the Chasm and go for the Early Majority segment, since our revenue model will be fee-based, a critical mass of users will be required in order to obtain profitability from SCENTS so this phase will be essential for the sustainability of the project. Our main target platforms will be: Opensea Rarible Superrare Mintable, Nifty Gateway and Foundation

Phase 3 (2024 – 2026): We will diversify our solution and adapt to other segments which are working with NFT and digital identity such as video games/ers; personal branding; influencers; designers, etc. In this sense fashion segment is showing a great acceptance of NFT since some early adopters such as The Fabricant sold their Iridescent dress NFT for around 10,000 EUR. Artist Danit Peleg sells clothing patterns for 3D printers as NFTs. In addition Nike is supposedly working on NFT sneakers that might be released this year. Thus, several markets are widening their approach to NFT and more are upcoming, the opportunities for developing standards according different needs are broad and BlockStart will allow us to deeper understand this technology to adapt it for these needs.

Funding: as a profitable company we blend our finance funding with our own resources and public funding, searching for new opportunities to apply our know-how in different industries, especially those related to sustainability. In this sense it should be noted we are exploring other uses case for applying SCENTS for Green Economy since waste management has similar problems to digital art: track the ownership of each batch residue and increase traceability on its journey to proper identify it has been recycled or landfilled. Therefore, SSI will be highly desired for the involved stakeholders, and we will increase our scope of actions while developing synergic projects in a priori completely different market segments.

2.5.5 Testimonial

“Participating in BlockStart has been a great experience since we have related to several companies focused in blockchain whether they were adopters or DLT providers. In addition, through mentoring sessions, our own development and tests performed in our adopter Hardddisk museum we have developed a MVP which will turn out in a new strategic business line for our company. Finally, it has to be highlighted this programme is ideal for those companies which are aiming to start a new project since BlockStart will provide not only funding for ideate and prototype the solution but will provide relevant training sessions and a rich ecosystem to increase exponentially your network.”

DENISA GIBOVIC, CEO, Blue Room Innovation

2.5.6 Public profile

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

<https://www.blockstart.eu/portfolio/blueroominnovation/>

2.6 Comunitaria

2.6.1 Company

Comunitaria works to make communities more prosperous and economically sovereign by promoting the local economy with social currencies.

2.6.2 Prototype solution

“Rooftop that Feeds” use donations to buy solar cells for the rooftops of deprived neighbourhoods, the electricity produced is then sold to the local commerce, the local commerce pay this electricity (to neighbours) using a digital community currency (instead of Euros), neighbours use the digital token to buy fresh food at the local commerce. Donation has a recurrent production (in local fresh food) equal to the lifespan of the solar cells.

2.6.3 Technical development during Prototype stage

During the development of Rooftop that Feeds, the following technical developments have taken place:

As MVP, solar panels were already installed on top of the Candelaria Church and an open-source power meter to measure photovoltaic power produced was installed (IotaWatt)

Also our IoT hub device (PATIO) was installed that runs a service that periodically reads the smart meters’s logs and publishes the measured data to our SaaS and to IOTA’s DLT. Our purpose is to save data as close as possible from where the energy exchanges were generated, without being

manipulated by third parties. The service running in the PATIO device is open source and publicly available.

Our BlockStart challenge is to be able to invoice the merchants with the electricity produced in ILLAs (our local community currency).

2.6.4 Business development during Prototype stage

During the development of Rooftop that Feeds, the following business developments have taken place:

Local shops are willing to try out the consumption of electricity from the energy produced on the rooftop of the Candelaria Church (our MVP). The key to build trust in us by the local shop it's been a year of dealing with our community currency, so it's a battle tested customer adoption test.

SMEs interested in testing the solution in Pilot stage

Photovoltaic providers: SME (Grupo Cuerva) who is an EPC (engineering, procurement and construction) photovoltaic plant and also a seller (marketers) and an SME (Barter Energy) specialized in "Energy communities" creation, both will help finance the installation of solar panels.

HOAs (Homeowners Associations): They're the KEY SME ADOPTERS for us, they're the ones validating the business case: use their rooftop to receive a local currency to buy at the local commerce.

Charities: The local church La Candelaria: they're already having a discount in their electricity bill, we want them to accept ILLAs as payments for the electricity their rooftops is providing.

Local shops willing to contract the energy produced at the rooftops of the neighbourhood: the other KEY SME ADOPTERS as they need to be willing to change their electricity provider and pay partly their electricity with our local currency.

Lessons learned: the project needs donations or public finance for the installation of solar panels. The premium risk for privately financing the installation in a deprived area is so high (65%) that makes the project non viable otherwise. Thankfully our neighbourhood of "Los Pajaritos" (inside the Cerro-Amate District of Seville) is likely to be included as "Entorno Residencial de Rehabilitación Programada (ERRP)" and therefore able to receive funds from the aid programmes for residential rehabilitation and social housing of the "Plan de Recuperación, Transformación y Resiliencia" from the Next Generation EU funds, meaning that it can receive up to 100% of CAPEX cost.

Product roadmap – After pilot: Develop a dashboard to be able to manage various HomeOwners Associations (energy producers) together with various local shops (energy consumers) for different neighbourhoods.

Business roadmap/go-to-market strategy – After pilot:

Replicate the MVP of Church "La Candelaria" in the 4 aligned homeowners associations in calle Celestino López Martínez. (4 months from completion)

Look for Next Generation EU funds for the energy rehabilitation of the entire neighbourhood. (6 months from completion)

Replicate in other Sevillian neighbourhoods (9 months from completion)

Replicate in other Spanish areas (12 months from completion)

Replicate in a low income EU Country neighbourhood. (24 months from completion)

2.6.5 Pilot stage implementation

In BlockStart, Comunitaria implemented its "Rooftop that Feeds" product in 7 SME adopters:

Pilot no. 1 with CACTUS:

Cactus is the company in charge of installing solar panels in the Los Pajaritos neighborhood.

As he already made the first installation of solar panels in the church of "Candelaria", now he will also be in charge of making another installation in the church of "Blanca Paloma".

Pilot no. 2 with Bar Cautivo:

The bar will be one of the buyers of solar energy within the energy community.

We are looking into the possibility that the facility can be one of the buyers of solar energy within the energy community. This would require an expansion of the solar panel installation.

Pilot no. 3 with TuComunidadAhorra:

Thanks to the participation of an owner's community manager, we will be able to get that they are interested in our project, since they are an important figure in the creation of an energetic community in the neighborhood.

Our goal with them is to get the first community of owners interested in participating. We are currently waiting to set up a meeting with the owners.

Pilot no. 4 with Cuerva:

A company so specialized in the energy area can offer us a wide variety of services to help us in our project.

After doing some tests, Cuerva is designing an energy measuring device with which we will be able to measure the energy produced, consumed and sold.

Pilot no. 5 with Association 3 Barrios:

The Association 3 Barrios helps us to contact the neighbors of the neighborhood so that they can try to buy fresh food with our social currency and so we can have different opinions from the people of the neighborhood.

The objective we have with them is that they ask the neighbors if they are satisfied using the illas to buy food in local stores and so for now they are quite satisfied using it.

Pilot no. 6 with Pescadería Juan Antonio:

They form an important part of the project in the process of transforming solar energy into illas, as they are in charge of purchasing the energy with illas.

In the pilot stage, we have managed to get the Candelaria church and the fish shop to sign agreements to share energy. Now we have to wait for the fish shop to pay its first bill in Illas.

Pilot no. 7 with Thunder Hunter:

The company related to the energy sector in which it offers its customers energy savings is a great ally for our project.

We want to create a "donate energy" program with them, so that part of the savings of their customers can be donated to the installation of solar panels in a poor neighborhood. We are validating how this could be done.

2.6.6 Testimonial

“We are delighted that BlockStart has promoted the search for partners who want to test our blockchain solution to fight malnutrition and poverty through solar energy. This is the highlight of the programme, which is very well mentored, helping you to think about the practical side of your developments with stakeholders who may be interested and involved.”

ELENA SILVA, COO, Comunitaria

2.6.7 Public profile

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

<https://www.blockstart.eu/portfolio/comunitaria/>

2.7 Digital Village

2.7.1 Company

Digital Village (DV) is a recomposition of social media, gaming, and e-commerce. DV is the first real-time sustainable Multiplayer Metaverse connected to its Social Marketplace, which merges the physical and digital world with its social graph blockchain interface, Village Protocol, and allows real utility of digital assets.

2.7.2 Prototype solution

The prototype product implemented brings clients closer to their communities and customers. Digital Village offers the Marketplace and the Metaverse. Customers are able to rent or buy land in one of our zones. At DV, we are collaborating with our clients to meet their needs, this is possible thanks to

our 300 3D artists and designers, collaborating with us. Events hosted on DV could include fashion weeks, E-games, conferences and overall interactions.

The Village Protocol focuses on decentralizing data instead of monetizing user interactions. Village Protocol is an interface to show their blockchain data in a way consumers understand easily.

The market potential is increasing globally, as our clients and end-users. DV is soon enabling real-time audio chat within the Metaverse, combined with AR/VR functionalities. Furthermore, we are aiming towards launching Metaverse mobile access in the near future.

2.7.3 Technical development during Prototype stage

During the development of Digital Village, the following technical developments have taken place:

DV's frontend development is connected to the implementation of our database and API system. Currently, within DV, we are setting up consistent team meetings every week – to check in, evaluate and set new goals. Thus far, we are on track with our timeline and in fact 5 month ahead, in terms of easy access to the Marketplace, and all relevant aspects of the website, visible for the public starting in Q2 2022.

With our current prototype we enable an easy sign-up process, easy client onboarding, seamless log-in from our Marketplace to the Metaverse, Product Creation, and viewing. We are blockchain agnostic and currently support Ethereum and VeChain.

The Metaverse, currently platform agnostic, combined with AI/AR/VR functionalities enables users to have utility to their digital assets in real-time, socialise via positional audio chat, create video and photo content directly from the Metaverse. Furthermore, we are aiming towards launching Metaverse mobile access in the near future.

2.7.4 Business development during Prototype stage

During the development of Digital Village, the following business developments have taken place:

We have not fully implemented our PR/Marketing strategy – we will have it running step by step whilst our beta version evolves and enables users to enter the Marketplace and finally, the Metaverse. The market potential is increasing globally and so do our clients and end-users.

We see the size of companies using our service could be anything from minor design studios to major/world leading organizations or brands.

2 is an ideal number of SMEs adopting DV to test the platform. This number is to enable DV and the SME to work closely together and take advantage of the experience to experiment and implement R&D for the DV products. The small number of SMEs would also enable DV and the SMEs to push the boundaries and innovation further, potentially discovering new solutions and improvements.

5 is the maximum number of SMEs for adopting DV. At this early stage of Web3, it is vital to educate the customers about the concept and opportunities of Web3, Blockchain, Metaverse, NFTs and so on. We believe in quality over quantity and would prefer to take our time with each SME to result in success stories, helping the SME, and turning them into long term clients of DV.

2.7.5 Pilot stage implementation

Here is a video summarizing Digital Village pilot implementation:

<https://www.youtube.com/watch?v=k7lnlZ-YwAY>

In BlockStart, Digital Village implemented its “Digital Village” product in 4 SME adopters:

Pilot no. 1 with VERTLINER:

Vertliner and Digital Village’s pilot collaboration has included consistent follow up meetings, and strategic planning for future collaboration, after the Blockstart program. Both parties has gained renewed visions of their product’s implementation areas as well as costumer base.

Data strategy/roadmap collaboration with Digital Village.

Vertliner will send DV their collected data and existing 3D assets, thus store those on the DV marketplace.

The roadmap will showcase future possibilities and the long-term benefits of both safety aspects and user value.

Pilot no. 2 with D-Visor:

By regularly following up on the KPIs agreed upon, D-Visor and Digital Village has come up with mutual value in terms of pilot implementations. Together both parties have found ways to connect physical and digital event whilst considering safety and future collaboration aspects.

The collaboration aims to connect physical events with digital and enable communities to interact all year around.

Together, DV and D-Visor will create a roadmap on technologies and data collection, use-case, roadmap, and identifying future possibilities.

Security solutions (IRL and URL).

Analyzing data to understand to meet visitors' needs in the digital space.

Pilot no. 3 with Binaré:

Binaré and Digital Village has mutual interests, which will lead to development for both parties. Technical perspectives have been the main focus as Binaré is focused on areas of cyber security. Therefore, Binaré has met with DV’s technical team to create future use-cases/roadmaps for future long-term collaboration.

Binaré will find the best ways for their platform (aiming towards the security of IoT/ devices/software) to automatically help the cybersecurity of Digital Village blockchain/ metaverse implementation. Binaré will apply "expert services" (as in "human expert" review of the technical and safety aspects of Digital Village).

Pilot no. 4 with Harddiskmuseum:

Harddiskmuseum and Digital Village's collaboration has been a fast process as both parties shared a mutual vision from the very beginning. Digital Village is currently building a museum for HDM in the DV Metaverse that will enable visitors to experience visiting a museum including exhibitions - in a digital shape. Entering as avatars.

Harddiskmuseum will set up their profiles on the DV Marketplace, and upload videos and static images/artworks to DV. Either for each user, or under the same domain. Around 10 artists will be exhibiting.

DV and HDM will collaborate on creating a museum in the DV Metaverse, where the represented artists' assets will be shown to DV and HDM users/visitors.

2.7.6 Testimonial

"The DV journey really accelerated after we joined the BlockStart programme. The organization and its network are amazing. We have gained really valuable mentorship and experience from the programme as well as partners and raised over 2m since joining."

EVELYN MORA, CEO & Founder, Inventor and strategist, Digital Village

2.7.7 Public profile

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

<https://www.blockstart.eu/portfolio/digitalvillage/>

2.8 HODLNG

2.8.1 Company

Our solution tracks the outcome on GHGs with granularity and traces a carbon-neutral cargo's compensation activities and status. We unlock the possibility of splitting the task of reaching an LNG carbon-neutral cargo by providing a solution for multi actors to decarbonize (offset a volume of GHG) on a cargo. The users can claim the delivered offset actions. An audit or third party can access for verifying the details of compensation activities. Throughout the transaction's lifetime, the system collects fees redistributed to NGOs, local communities, or associations vetted by the stakeholders.

2.8.2 Prototype solution

The overall concept is to track and record the GHG, CO₂, and other related polluting gas, emission, consumption, and savings in parallel biogas production by a biogas plant. Based on savings, a corresponding number of credit tokens will be created and awarded to the biogas producer. A third party interested in offsetting its emission can connect to the solution and request to buy (or swap

against other activities) some credit tokens that will be delivered together with a proof of origin of the compensation activities. The original owner of the credit tokens will receive a payment or an equivalent compensation (e.g., a service or the supply of material).

Following further investigations of the ecosystem and our discussions with several stakeholders, we consolidated the concept by extending it toward a comprehensive view that integrates all the supply chains in the biogas production process. The idea now considers the source of the material (e.g., feedstock, organic waste) used for biogas production and estimates the amount of emission or savings depending on both the source and the biogas production processes. By comparing the generated gas emissions with or without using the primary source in biogas production, we can assess the savings vs. the costs without biogas production. This will also highlight further the difference between using waste vs feedstock. Then during the biogas production process, some non-biogas gas may also be filtered and separated for being reused in other industries. This will also account for specific savings. This improved concept enables, in addition, distribution rewards to the savings parties along the supply chain.

Note that at this stage, all savings/costs are mainly based on general estimation, but it is foreseen to rely on the existing probes in the system to measure them when possible.

Finally, additional features related to data sharing and auditing capabilities will be planned in the future. It was emphasized the value of allowing additional stakeholders (e.g. auditors) to use the solution, as will benefit from the information collected by the solution.

2.8.3 Technical development during Prototype stage

During the development of Biogas TX, the following technical developments have taken place:

Most of the blockchain and database management building blocks rely on our MVP's existing back-end architecture, and thus can be considered ready (modulo small adaptation to be made during pilot phase)

A fundamental building block is the set of smart contracts that will support the GHG/CO2 credit, offset and reward functionalities.

Test of several design concepts for the smart contracts and tokens to be implemented. Part of the internal tests made is based on preliminary concepts of carbon credit tokens tried during several hackathons by HODLNG blockchain developers (cf. an extract in Annex).

2.8.4 Business development during Prototype stage

During the development of Biogas TX, the following business developments have taken place:

The main lessons learned from the iterative validation meeting with biogas stakeholders conducted with prospective customers have underlined a paramount curiosity by biogas producers into the idea to tokenize the level of negative CO2.

The interest in adopting new technology has aroused much attention, on the one hand, but also more commitment than we had expected.

Receiving support of compensation for their activities has highlighted the need to be less dependent on public financial resources and the need to relaunch a virtuous dynamic to encourage the development of biogas.

HODLNG successfully achieved KPIs

prospected 76 biogas producers within LinkedIn and generated 54 leads surpassing 14 of the expected KPIs (KPI/40) of the initiation of consumer interest or inquiry into products or services of our business. We achieved approximately more than 70% of our prospects.

We converted 9 of our Marketing qualified leads (MQL) to the discovery calls to collect functional needs.

We proceeded at in-depth talks focused on product functionalities and tech interactions with 7 companies. (KPI/4)

In the end, we came up with 7 declarations of interest for pilot (3 Eligible +4 Non-Eligible) (KPI/3)

We expect 3 SMEs to join if there are no administrative barriers: (KPI/1)

2.8.5 Testimonial

“Thanks to the Blockstart programme, HODLNG’s team has got the opportunity to apply our solution to liquified natural gas to one for biogas sector. We had this idea in mind since a while, and it’s become a reality throughout the program. The added value of the programme lies in its two-sided involvement, which allows us to approach the users rapidly and efficiently.”

JEAN-CHRISTOPHE FINIDORI, CEO & Founder, HODLNG

2.8.6 Public profile

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

<https://www.blockstart.eu/portfolio/hodlng/>

2.9 HOPU

2.9.1 Company

HOPU brings innovation through the latest technologies such as AI, IoT and Data-Quality. We are there to support decisions for environmental assessment and digital transformation through data-powered tools with dashboards, decision support tools and our genuine IoT devices to monitor (Smart Spot). It promotes platforms as FIWARE promoting on top of this added-value via data quality, cost-effective solutions and services to monitor gases, toxic substances, odors (VOC) and emissions from industry.

2.9.2 Prototype solution

The prototype developed consists of an industrial emissions monitoring system, conceived as a Policy Based Solution (PBF) via Blockchain, certified IoT for indoor air quality monitoring, other heterogeneous data sources and visualisation tools (dashboard: dashboard example). The approach selected for the prototype is, specifically, to handle authentication and authorisation of carbon emissions through PBF in order to enable trustable and reliable data. Thanks to the proposed solution, customers will have an evidence-based value chain of their emissions: monitoring – certification – recording and regulatory compliance – compensation / monetisation.

The main technical aspect resides in the integration of an alert register service based on blockchain in the industrial ecosystem. In this approach, two security services will be enabled: Ethereum (public and private keys) and PBF. Moreover, other contextual data will be integrated, as each competent administration issues the allowance of emitting an amount of CO2 emissions consistent with its economic activity as well as the total amount allowed in the country (Paris Agreement).

Finally, it is expected that the SME adopters will implement the digitisation of their manufacturing processes for controlling their emissions via continuous monitoring and specific consultancy services to support them. By using the solution proposed by HOPU in BlockStart, companies will be able to finally generate Tokens / monetisation that ensure the reduction of their emissions as CO2 credits with an economic value on the market.

2.9.3 Technical development during Prototype stage

During the development of HOPU, the following technical developments have taken place:

Device and certificates onchain:

Translate off-chain certificates to on-chain. (In process)

Develop third party Certificates Smart Contracts.

Calibration process

Calibration Lab

Develop Device id Smart Contracts.

Internet of Things onchain:

Integrate IoT platform with Blockchain node.

Generate offchain rules for store onchain events.

Generate offchain rules for store onchain statistics.

Generate Grafana dataSource for Dapp.

Generate Grafana panels.

Test the IoT Minimum Viable Product (MVP):

Calibrate devices.

Emit certificate.

Deploy devices.

Validate device events.

Validate device statistics.

The main features of the solution were conceived after previous experiences in pilots with industries, where real-time indoor air quality monitoring was performed. Definitely, after several iterations, HOPU has been able to advance and provide added value to the solution in the Blockstart ecosystem, adapting the features towards a value chain that consist of monitoring – certification – recording and regulatory compliance – compensation / monetization, where customers can not only digitize their processes but also to optimize and become then in a more sustainable version by integrating the comprehensive proposed solution with the following features:

Certified measurement via IoT indoor monitoring devices

Real-time emissions monitoring via dashboards

Registration and management of emissions via Blockchain (digitization of industrial processes and certificates issuance)

Consulting services for assisting customers / users guidance (optional added value)

Access/ connection to third platforms to finally obtain sustainable tokens (monetization of carbon emissions reduction)

During the next 12 months HOPU expects to perform the pilots with Bersey and Horizer, as SMEs adopters and make a deep analysis of the performance. After the pilots stage, HOPU commits to continue collaborating with them in different ways:

Publication of success cases in different means of communications, blogs and journals at international level: HOPU will ensure the visibility of these companies as early adopters in terms of demonstrating the benefits they will obtain thanks to the integration of trustable and reliable IoT by integrating certification via blockchain.

Free use for the first year after performing the pilots to continue testing the solution and providing feedback.

Moreover, HOPU expects to launch to the market the proved MVP, which is expected to reach a TRL8 and:

Get in contact with stakeholders

Attend relevant events / fairs

Cold calls and emails

Design new dissemination materials to attract new potential customers

Schedule meetings with different stakeholders

2.9.4 Business development during Prototype stage

During the development of HOPU, the following business developments have taken place:

The target customers have been differentiated in two types: final adopters and intermediate adopters. The final adopters are large scale industries that individually will purchase the solution and require directly our services because of their needs to certify their emissions and the current emissions regulations. On the other hand, intermediate adopters are small industries which have a low development of digitization of their processes but require our services due to their relationship with other large scale industries (they perform as suppliers) and are asked to integrate emissions certification of their processes to keep their relationship.

Revenue model and streams: our plan for generating the revenue is based on a B2C Business model supplying companies in the industry sector via direct sales and marketplaces, complemented with B2B to address market expansion via distributors/partners that integrate our solution as part of their offer.

The fundraising strategy is based on recurrent revenues as part of the added-value services provided by our SaaS for data analytics of environmental data, and the consulting services to customize dashboards, and integrating the data sources required to adapt the solution to every individual needs. Current income streams are based on the sale of the solutions and consultancy services, which as a baseline has a cost between 15-30k€ (with an ARR of 15k€ and taking into account that the average LTV per customer is 180k€, and is based on recurrent revenues as part of the added-value services provided by our SaaS for data analytics of environmental data to address climate change mitigation. In detail, HOPU is today in over 40 cities; with a turnover of over 1,2M€. HOPU is pursuing and promoting a scalable solution to take advantage of the SaaS and data economy as our major tractors.

The commercial presentation will be performed via different communication channels utilizing several marketing materials: on the one hand, potential customers will be identified in business databases by categories at regional, national and international scale and also will be reached via physical events and industrial clusters. HOPU will offer different audiovisual materials adapted to each target user: white paper (to raise their awareness and inform them in depth about the current issue related to carbon emissions and the offered solution), a video for a short presentation and leaflets to present the solution in general and, finally, live demonstrations via webinars.

3 new employees will be hired in January 2022 in order to boost the sales and marketing department at national level. The first profile will be focused on the LATAM market, the second profile will support our market entry strategy for Germany and, finally, the third profile will focus on the Arab region (as part of the Zakut programme in which HOPU is already participating).

Effort to validate your market/fit:

No. of potential adopters you reached out to: HOPU has reached 6 SMEs adopters from different industries in the Blockstart ecosystem to perform de pilot.

No. of potential adopters you met: as HOPU is already in contact with several industries at regional and international scale, 5 potential early adopters are currently interested in acquiring the solution.

No. of interesting prospects/leads you have acquired during Prototype stage: HOPU has been directly in contact with 3 SMEs: Bersey, Horizer and Advanced Microturbines.

No. of pilots committed: currently we have agreed to perform 2 pilots with Bersey and Hozier.

No. of clients committed: 3 clientes are currently highly interested and committed. Via Bersey, as consultants, they are directly in contact with potential customers, as the case of automotive industries. In this case, Volkswagen Barcelona's plant and SMEs that are their suppliers. On the other hand, Horizer has asked for further details of the solution in order to start not only implementing it in their use case but also offering as B2B2C solution to their customers-

HOPU is currently participating in the Tech & Innovation HUB Zakut, thanks to which we expect to scale our solution internationally.

EMUEGO: is a global blockchain technology company providing solutions for developers, startups, enterprises and governments. EMURGO develops enterprise-grade applications, builds developer tools, invests in startups and provides blockchain education and advises on Cardano's decentralized blockchain ecosystem.

Future Digital Awards 2022

IoT Solutions world congress. Track: blockchain solutions world. Barcelona, May 10th 2022.

HOPU will be attending and participating actively in events at national and international scale:

#ACCELERATERegTech2022 5th annual, The RegTech Association eco-system event.

AI4CITIES: Accelerating carbon neutrality STAVANGER event December 6th 2021.

Paris Blockchain week summit 13th April 2021

Reset Connect London 2022. The UK's largest sustainability ecosystem and ESG investment gathering will take place 28-29 June 2022 at ExCeL in London

2.9.5 Pilot stage implementation

In BlockStart, HOPU implemented its "Industrial emissions monitoring" product in 2 SME adopters:

Pilot no. 1 with Horizer:

CO2 emissions of token into a voluntary market based on the CO2 Marketplace guarantees the reliability and availability of data to all CO2 buyers.

Smart contracts. Monetization in form of Tokens system via carbon trading marketplace.

Pilot no. 2 with Bersey:

The solution provides specific recommendations to the user depending on the consumption in the consulted period.

A service has been created that monitors the average consumption of all data to date.

The user can search for the monitored data of interest in the history graph and check the exact value to which it corresponds.

Emissions control (regulatory compliance) via IoT air quality monitoring devices (context and real time data). Pollutant gases, noise, PM, temperature and weather. Emissions Reduction / Compensation.

2.9.6 Testimonial

“Thanks to our participation in this programme, HOPU has been able to evolve and land its final prototype focused on enabling emissions monitoring based on a Policy Based Framework (previous experiences via pilots allowed to reach a TRL 6). The ideation of the MVP, which initially focused on the need to monitor indoor air quality, has now evolved to a more comprehensive added value and trustable solution, adding other valuable data sources on carbon emissions and emissions rights exchange (monetization/credits) via blockchain / certification. Finally, after the ideation and prototype stages, together with the different mentoring sessions with Blockstart mentors and other support from external experts, such as Alberto Ezcurra, from Bersey, HOPU has finally improved and adapted the final prototype to different scenarios. These scenarios are based on real needs detected in different industrial environments and their issues related to emissions control, certification and emissions trading and compensation, which are subject to their national regulatory framework.”

ANTONIO J. JARA, CEO and R&D Director, HOPU

2.9.7 Public profile

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

<https://www.blockstart.eu/portfolio/hopu/>

2.10 Shipnext

2.10.1 Company

Imagine a platform that allows you with instant search of the best shipping for any cargo regardless its type, shape, quantity or destination? Shipnext is a solution that uses AI to help with instant freight search, shipping data management, email processing, trade and workflow automation.

2.10.2 Prototype solution

The Smart Contract, based on an electronic Bill of Lading, is a secure and reliable document. Electronic Bill of Lading, built on Shipnext, enables a unique mix of data-flows. While both Shipper and Ship Owner, as well as the intermediaries, such as Charter and Carrier, get involved in the contractual relationship on the shipping platform, Cargo and Ship data are logically streamed into the Bill of Lading – a document representing a receipt of goods, evidence of the contract of carriage, and document of title. Such Bill of Lading, based on online negotiation, also includes the link to the terms and conditions,

which are sourced from the Contract of Carriage. Last but not least, the document is secured with digital signatures, satellite data and data sourced from operational data. Storage of this data on multiple nodes, facilitates tokenization and transfer of this document with the help of DLT-based ecosystem. This, in turn, serves as a method of seamless transfer of the Shipnext electronic bills of lading, representing the execution of the contract of carriage. Electronic Bill of Lading, and Smart Contract of Carriage, built using our prototype, can leverage Shipnext to enable the secure peer-to-peer transfer of eBLs, reducing costs, delays, risk and fraud.

2.10.3 Technical development during Prototype stage

During the development of Smart Contracting for Shipping and Transportation, the following technical developments have taken place:

Shipnext achieved the status of a digital shipping platform and a shipping marketplace.

Shipnext patented and launched the process of combining email processing and a digital shipping platform for freight-matching, freight negotiations and contracting.

Shipnext covers all sectors including dry-bulk, breakbulk, containerized, heavy and oversized cargo. Wet-bulk is still not covered sufficiently, but it is currently in process.

The main features include:

Trading Desk – a cargo-to-ship and ship-to-cargo matching solution, that includes features for cargo search, ship search, freight negotiations and contracting

Cargo Monitor – solution for tracking offered and received freights, contracted cargo and cargo tracking

Fleet Monitor – solution for ship search, ship tracking, compliance check

Freight calculator – automated freight calculation tool

Documents – data-base of contracts and bills of lading, with contract management tools

Port Data – solution for monitoring real-time port data

In 2022 Shipnext expects to build and launch the following functionality:

Messenger (Chat) with advanced features for internal communication, external communication and teams

Freight matrixes – a solution for the use of predictive analytics in freight market forecast

Supply Chain manager – a solution for supply-chain management and cargo tracking

Smart Contracts and interoperability with banks, P&I and insurance companies.

2.10.4 Business development during Prototype stage

During the development of Smart Contracting for Shipping and Transportation, the following business developments have taken place:

Shipnext is currently holding talks with several potential new partners, of whom the main ones are:

Senda – for email service integration inside Shipnext

Bolero – for interchange of electronic bill of lading data

Freightify – for exchange of container freights and shipping solutions

Shipnext is also planning to onboard 2 carriers onto online freight contracting, thus increasing the amount of contracts of carriage generated through the digital platform.

Among the currently expected customers, we expect breakbulk, dry-bulk and even tanker shipping companies to use Shipnext for email processing.

In January, in addition to the integration of its Electronic Bill of Lading in the Blockchain ecosystem, Shipnext will commence refactoring and the development of its advanced Messenger (chat). We believe that the use of a more advanced Messenger will help our users finally replace email services.

Our newly appointed CEO Nat Hutley plans to involve 6 C-level executives, from UK, Switzerland, Turkey, Singapore and USA as company's Advisors. Our current pilots with Agromond, Varamar, Solvay, Ifchor, and several other companies, would help us build the missing features that are related to all sectors of maritime trade. This way, by May 2022, we should have no functionality which is missing or requires work outside Shipnext to fulfil the daily chartering and commercial shipping activity.

Our current ambitions include onboarding:

5 large international brokerage firms

6 large shipping groups, including 3 in dry-bulk, 1 in breakbulk, 1 in taker and 1 in container shipping

10 large international trading firms, including coal, wheat, sugar, fertilizer, steel and chemical trades

In December 2021, Shipnext received one more patent, this time for Singapore. This patent, just like the other patents so far received, covers the process of combining a shipping platform with email and data processing, with the help of NLP, machine learning and big-data analysis, for freight-matching, online freight negotiations and contracting. In January 2022 we plan to apply for Vlaio Fund, and the Y Combinator. In April 2022 we expect to finally receive USA and Chinese patents.

2.10.5 Testimonial

“Today's end users, companies and governments begin to understand and, more importantly, feel the importance of international transportation and supply-chain. It's important to see and feel that European Commission and the blockchain community in Europe give support to European companies that transform the transportation industry. This will help maintain the central role and key presence in international trade.”

ALEXANDER VARVARENKO, Founder & CEO, Shipnext

2.10.6 Public profile

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

<https://www.blockstart.eu/portfolio/shipnext/>