

CAPSTONE PROJECT SUMMARY

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Submitted to

Central European University

Department of Economics and Business

In partial fulfillment of the requirements for the degree of MS Finance

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Budapest, Hungary

2022

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Liquid protocol whitepaper - summary

Introduction

The process of short-term bank lending is often very bureaucratized. This is due to the clearing and settlement – these processes require verification of huge amounts of data. The banks need to observe the state of the balance sheets of their potential clients and assess the respective risks. Some procedures are also to be done due to the legal compliance. If all the necessary data was securely stored, timely updated and accessible in one place, this could simplify the process of issuing loans substantially. Liquid – is a Hong Kong-based startup that developed a blockchain solution to solve this kind of problem. The project is currently piloting, however, there is a room for the overall development. The task is to write a whitepaper reimagining the functioning of the whole protocol.

Let me first briefly discuss some key concepts necessary to understand the scope of the task. The data is in the center of the whole idea. The blockchain technology allows to store the data securely and reliably while allowing the discriminate access. What is behind the safety of the technology? The data in blockchain has a block structure – in case any of blocks is modified, there is a need to modify all the following blocks. Each block contains the hash of the data in the previous one – in this way the immutability is achieved. The data is stored on numerous computers and the consensus mechanism ensures that all of them agree on the same set of data.

The data is stored as non-fungible tokens (NFTs)¹. This stands for the data that is stored by the participants in the network. In our case, this will include companies' ownership and receivables data. The tokens are created and maintained by code scripts stored on chain. These code scripts are being referred as to smart contracts. The tokens are being created based on the messages sent to the contracts, but also the information inside the NFTs is being updated. The whole project (protocol – see below) is being built on the Ethereum blockchain.

The protocol is even a wider definition – this encompasses all the smart contracts and their interactions. The whole workflow may be managed by more than one contract. This includes: what kind of messages the protocol participants can send to the contract, what are the consequent actions and how do the counterparties in the protocol reach agreements.

¹ In the case of our protocol, we refer to dynamic NFTs. The good description of dynamic NFTs is here: <https://blog.chain.link/what-is-a-dynamic-nft/>

Beside from the introductory part, the whitepaper has two more important parts. First, there is a need to explore similar protocols. In other words, in order to effectively describe the workflow of our protocol, we need to look at similar previously developed concepts. Also, the information about similar protocols will provide some extra ideas and help to enrich the functionality of our protocol. Second, we need to explicitly engineer in detail the workflow of the protocol. We need to describe what kind of data will be stored inside those NFTs, where this data originates, how many smart contracts are needed and their functions, and potentially some other important elements.

Exploration

As previously said, it is extremely important to make research on previously developed protocols, that are at least somehow related to our project. In the whitepaper, we have explored two types of protocols. First, we had to look at other decentralized lending protocols. In most case, the security of the loans is guaranteed by overcollateralization (AAVE)², in some cases by the presence of the legal claim via the special purpose vehicle (Centrifuge)³. Both of these two approaches have disadvantages, and, in our whitepaper, we address them. The principal question is also what kind of asset should be used for lending on the protocol – in this extent it was helpful to look at the architecture of stable asset protocols (Synthetix)⁴. The stable assets are more easily transferred if compared to the fiat currency, but the question is whether they are liquid enough. In the end, we have decided to focus on integration with the Central Bank digital currency (CBDC)⁵, as this resembles fiat but allows for more efficiency.

Second, since our protocol will be dealing with data NFTs, it is also crucial to look at how other protocols were able to use blockchain to unlock potential benefits of the data sharing. Most of the protocols allow for sharing of any kinds of data between participants. For instance, Ocean protocol allows companies to publish their datasets and sell on-chain tokens to others that entitle their owners to use the dataset. It is especially helpful in combination with the “compute-to-data” technology, where it is possible to train models on data without actually seeing it. In our

² See <https://medium.com/coinmonks/a-detailed-study-of-the-aave-platform-and-token-1310908b8a08#:~:text=The%20%24AAVE%20token%20has%20two,operating%20decisions%20of%20the%20platform>

³ <https://docs.centrifuge.io/learn/legal-offering/>

⁴ Samuel Brooks, Anton Jurisevic, Michael Spain, Kain Warwick: “Haven – decentralized payment network V8.0”

⁵ There is still ongoing research regarding the application of CBDC. There are several ongoing projects. More information: https://www.hkma.gov.hk/media/eng/doc/key-functions/financial-infrastructure/e-HKD_A_technical_perspective.pdf

case, the research helped us to construct the structure of our data NFT. In our case, it is the company data that can be accessed by banks in the event of loan application.

Finally, we need to be relevant with the architecture of oracle protocols. We need to integrate the blockchain with other systems: the warehouse management systems and CBDC system. Oracle protocols are responsible for feeding external data into the network or opposite way. The data is fed by a number of participants to ensure accuracy. Also, oracle nodes must possess technical capability to feed in the particular data. This is a necessary part of the protocol's architecture.

Concept development

We had to write down a detailed description of the protocol's workflow. As previously said, this includes all interaction between participant, data involved etc. Now, I briefly explain the main points regarding the development process. First, we have got to decide about the general nature of the newly developed protocol. All the decentralized protocols are peer-to-peer or possess common liquidity pool. In our case, the aim is solely speeding up the bureaucratic processes rather than directly challenging incumbent banks. Therefore, the system is designed to be peer-to-peer. The smart contracts manage communication between clients and respective service providers. The clients decide about borrowing (or insuring receivables) outside of the protocol. The client sends a specific message to the smart contract, the contract resends it to the bank (insurance company). Once the bank agrees to lend, it sends a specified confirmation to the smart contract. Afterwards, the contract uses the credentials of the bank to initiate transactions in the CBDC system. The history of transactions is securely stored in the companies' NFTs.

Second, what kind of data the companies' NFTs should contain? The most important is that it contains ownership data – this is very important for lenders. The crucial thing is the balance sheet data, specifically about receivables. This would help banks to evaluate their risks more properly. Also, it is necessary to include the data about insurance of receivables – once the insurance is purchased, it is staying on chain and visible for potential lenders.

Third, it is needed to define the medium of lending of the protocol. The first option would be to use fiat currency, but this is a very bureaucratic way and hardly coherent with the idea of our protocol. The other option was to use stable asset backed by another protocol (again Synthetix for instance). In this case, there is a need to rely on stability of the chosen stable coin. We have decided to plan integration with the CBDC system. This allows for to make the transactions

efficient while preserving legal claims. In this way, we can also avoid relying on other protocols for stable assets.

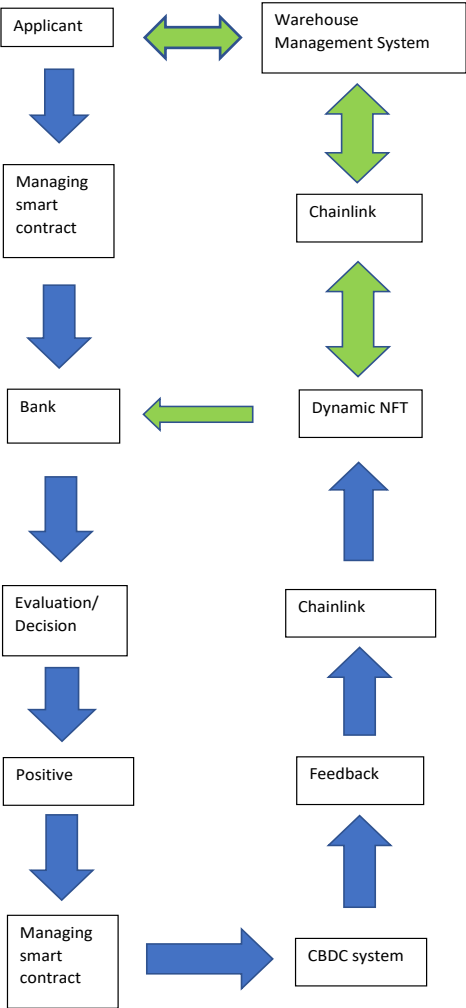


Figure 1: The workflow of the protocol – the lending smart contract

Finally, the insurance of receivables can also be purchased using the protocol, as insurance companies will be able to join and benefit from the network. The insurance mechanism is going to be managed by a separate smart contract, and the process of insuring receivables resembles the process of borrowing. The data regarding insured receivables is stored in the companies’ private NFTs.

Summary

In this short report, we have outlined the main components of the Liquid protocol whitepaper and briefly discussed all of them. The start-up aims to simplify the process of short-term lending to companies by utilizing blockchain technology. We have explained the basic concepts required for proper understanding of the topic, described the architecture of relevant protocols,

and summarized the structure of the conceptual idea. The whitepaper itself is intended to serve as a guide to the actual development. For more details and references, it is recommended to consult the original whitepaper – since this is only an excerpt.

