WORKING PAPER

Executive Summary

Our idea is to implement a reputation protocol useful for integrations between industries and blockchain technology. In detail, this will act as an oracle to check the reputation of any participant in blockchain transactions. Every project that develops blockchain infrastructure can use this protocol to offer valid data for developers. In my opinion validity of data for blockchain can be obtained now in two ways. One is reputation protocol which will act as a filter for wallet addresses. The second is IoT sensors and devices. The latest is very useful in supply chains. But for the banking system, financial and social reputation are more appropriate to use. Access to reputation protocol will be granted through tokens defined on major blockchains.

The implementation plan, at the blockchain level, consists of a few stages. The first is to define and deploy a token on a blockchain. We chose the ERC-20 Ethereum standard because today contains the most complete specifications. In the next stage, we will build a playground for our research team. This will consist of a suite of smart contracts developed in Solidity language. Because many blockchains lack scalability, most probably smart contracts will be deployed on a side blockchain. In our case, we will use the Polygon network. There will be a few types of smart contracts. As a start-up, we need early investors' support, and we need to build Defi smart contracts like stacking to achieve that. To test our reputation algorithms, we must build a community around our project. Smart contracts will be focused on different game theory applications. The last type of smart contract will be built to bridge our token on different blockchains. This is very important because reputation protocol must serve all important blockchains, to achieve a high level of trust. The wallet will be another key element in our project. It will gather data to compute financial and social reputation. Different APIs will be used to access, store and secure transactions between users. The final stage is the governance system. It will be based on the votes of token holders. Technically speaking we will use a distributed chain like Holochain. For us seems more suitable for a voting system than blockchain technology. As I mentioned before, all projects which operate a blockchain infrastructure could use reputation protocol. Typically, those blockchains networks are connected somehow to different industries, offering them data integrity. Through blockchains, our protocol delivers valid data to many types of industries: banks, insurance, education, entertainment, and many more. However, one that we focus on now is the luxury objects market, specifically the paintings one. It is very well known that these types of transactions carry a lot of risks and privacy issues. Our protocol along with technologies like blockchain and AI could solve many of those issues. Building a reputation system for art sellers is a priority these days. This will limit fraud and fake transactions. More than that writing secure smart contracts will solve many problems that can occur during the transportation process between seller and buyer.

Problem Statement

Transactions with art objects are very complex from many points of view. One is the relationship between seller and buyer. The first question which a buyer has in mind is how and why I will trust the seller. Or in the case of purchasing through some broker, as a buyer I can doubt these intermediary good intentions. On the seller side, the same

questions could arise. Trust between both or three parties is hard to be achieved. No to mention that is very costly because many times other parties are involved, like lawyers. Suppose that the early stages of the transaction are ok, transportation is another big issue. Some objects require special conditions to be moved and tracking their route is very important. And what about the biggest dilemma of buyers: did I buy the original or some cheap copy of the painting? Hiring an art expert is a solution, a very expensive one.

Blockchain technology could help all parties involved in such types of transactions. But not alone. To construct a secure and trustable transaction we need to start with valid data. This data in our case will be provided through reputation protocol. Buyers, sellers, brokers, lawyers, transporters, and experts all must have a reputation passport. This passport will reduce friction between parties. Blockchain will take care of data integrity. If we consider a permission blockchain then all parties involved in the transaction can secure verify partners' data. Privacy and transparency will be assured as well. And yet blockchain needs data from IoT devices to track shipments. Also needs AI to reduce cost with expertise made by humans. Blockchains are the center of all actions. A good solution using this technology will bring costs of verification close to zero for art transactions. A special mention is that third parties are not eliminated from the process. Just evolve lawyers with smart contracts, transportation with IoT, and experts using AI technology.

Outline of Vision

The creation of a reputation passport is a key element for our solution. It will be based on two major components. Social and financial reputation. Speaking about social reputation, this will be technically developed on Holochain. Holochain, even it is not a native blockchain, offers us great ways to isolate groups of users reducing in this way the cost of networking. Groups are the main unit we take into consideration for the social reputation approach. Two important factors are, for example, gaining reputation through donations or averting climate change. Considerations about financial reputations are multiple: source and destinations for transactions, types of those sources and destinations addresses, number of transactions, the amount involved, etc. To those, we add lending or borrowing transactions made by an address. Both types of reputation will use for the computation private collaborative networks model.

We will start building the artist community with the help of students from the Art University of Bucharest. Our application will offer them the environment to create and transact NFTs which will be digital copies of their creations. We will create a simulation world of art based on blockchain technology. Students' involvement in the application will be incentivized with different amounts of tokens. Besides the fact that we will use all their experiences in our research, the application will help them to access the NFTs market.

The moment the study case on Romanian students will be finished we can move to real market application. We will develop a blockchain-based marketplace where buyers can meet sellers and check each other reputations. In the pre-transaction stage, we offer them the possibility of communication via direct messages. The communication will be encrypted end to end. We assume that at this stage buyer can trust the seller and vice-versa. A unique escrow smart contract will be deployed on the blockchain. The effect will be that seller will receive the money when the buyer receives the art object. The art object will carry a unique QR code that is generated by the contract. This code can be read by the wallets involved intro transaction and no one else. The art object will have also attached a small GPS sensor. Every time when the object is in a stationary position for more than three minutes, that location is saved into the blockchain.

The processes involved in art transactions are many and those described earlier are

just some of them. Let's think now about the insurance process. In most of the case, art objects are expensive and need an insurance for the road between seller and buyer. Insurance could be a smart contract also which reads both party's reputation, object values, etc. In this case, blockchain reduces costs with resources involved in the process. If we talk about expertizing processes, blockchain needs AI technology to help human resources. The expert will still have the main role, but his work could be saved on blockchain and once an art object is certified then it will be no need for another expertise.

Blockchain solution

The beneficiary of our reputation protocol will be companies and people. If we apply this protocol to the healthcare industry, we can see that anyone needs to be identified somehow. People could have a reputation based on their proactive measures to stay healthy. This way they can access proper doctors. The reputation of the last ones is also a changing factor in time. Clinics will play a different role. They can route people to services that are right for them. To do this they must work with valid data from reputation protocol. So, everyone can use our application based on blockchain technology.

Our mobile application will be developed on blockchain mainly. The wallet and smart contracts collection depend on blockchains. The part dedicated to social games will be created on distributed networks, that are somehow derived from blockchains. AI will play its part in the arbitrage of social games. Training of neural networks with real data get from these games is an essential part of our application. IoT sensors like GPS to track routes for art objects and biometrics sensors used in health monitors are just other examples of complementary technologies.

One of the main characteristics of our project is the model of the reputation system. Unlike advanced rating systems used by eBay or Amazon today, we want to implement a system based on collaborative ratings. We believe that reciprocity is essential to quantify a relationship between two or more people. Our goal is to correctly identify someone through relations between him and his friends or community. To be efficient our protocol must be available for all blockchains. This means that we must create bridges between them at the level of smart contracts. One way to secure wallets is by designing them as a multi-sig type. A social multi-sig system based on our reputation.

Chainlink is an oracle that helps to transfer data from the off-chain world to smart contracts. In 2020 Chainlink became one of the top providers of data for blockchains. BAND protocol enables smart contracts to connect external data sources or APIs. BAND will run its blockchain network based on Cosmos technology. DIA is a protocol used to source and validates financial data. It aims to be a platform to verify market data. As we can observe the competition is very weak or absent now.

Digital ecosystem

Tokenization plays an important role in blockchain-based projects present in the crypto world. It is known that ICOs are a good instrument to capitalize projects. However, we avoided this approach because of future regulations. The main roles we designed for our tokens- XCRED are the right - means that holders of tokens can participate by voting in the governance system, the value exchange - token as a unit of value can be exchanged on CEX or DEX between buyers and sellers, the toll - tokens used by anyone to access data from reputation protocol, the earnings - users will be a reward for stacking process and the currency - when tokens are present inside ecosystem payments. The core team will have allocated 15% from token emission. 20% of tokens will go to the foundation which will be responsible for operational costs, product acquisitions, and patent registering. 10% will be allocated to marketing activities. The rest of 55% will be for the users and investors on the market. Users can also win tokens for social

activities necessary to run study cases. Redeem of tokens will take place by the foundation for community incentives, with special occasions or events.

The last mile

Connecting technology to the offline world is not an easy task. Especially if we are talking about missing links between those two sides. We aim to create this protocol that will bring blockchains along with AI and IoT closer to the people. Mass adoption is our target. However, this is not an easy task. Many problems could arise in this process. One of them is the mathematical model. Creating a reputation passport without asking for personal data is challenging. We must build communities, stimulate people's interactions, and measure them. Also on the financial side, we can face issues for getting people involved in our designed games. Core protocol will not be enough for every industry alone. That's why we will have to research and develop customized versions to be applicable in different industries. Blockchains could help us through the transparency they have. Accessing data related to financial transactions between wallets is a major achievement. Their decentralization nature will improve our application security as well. Smart contracts as a layer upon infrastructure will serve our scope to reduce costs of verification and some third parties from offline world.