# CHRONOBANK - REVOLUTIONARY PLATFORM FOR CRYPTO ASSETS MANAGEMENT

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Abstract. This whitepaper abstractly describes a system designed to tokenise labour-hours using blockchain technology. ChronoBank is a proposed implementation of the described system that can be deployed in several economic localities. The proposed system leverages smart contract techniques to automate a process whereby a country-specific 'labour-hour' token may be redeemed for real labour-hours via legally binding (traditional) contracts with labour-offering companies.

ChronoBank is also the platform with the wide functionality that may become available for Time Token holders.

## 1. Introduction

With the advent of cryptocurrencies, relatively instant low-cost transfers of value have become a reality. Blockchain technology, which is a defining feature of most cryptocurrencies, has recently been applied to solve a great variety of problems. Currently the most widespread implementation of blockchain technology is Bitcoin [1], which is a simple asset transfer system. The asset in Bitcoin's case is a bitcoin (BTC). The value of this token has seen rapid variation since its inception in 2009, which has hindered its feasibility as a global currency.

There have been a variety of attempts to realise the advantages of blockchain technology while simultaneously mitigating issues regarding the stability of value for cryptocurrency applications. To achieve this, many attempts employ the notion of a *stable-coin*, whereby each token of value in the system has a counterpart of equal worth stored in a non-digital and tangible form in the 'real world'.

Two example implementations of the aforementioned *stable-coin* paradigm are listed below:

**USDT by Tether**[2]**:**
Each USDT token is backed by an equivalent amount of United States Dollars (USD) held in a reserve account by the private company Tether Limited.

**Digix**[3]**:**
Each token is backed by an equivalent amount of gold, which is stored in reserves by a dedicated precious metal storage custodian.

In both examples, it is always possible for a token holder to redeem that token for its counterpart, thus ensuring its fundamental 'stable' value.

Another notable example of a *stable-coin* is Bitshares [4], which attempts to decentralise the entire system through the use of digital Contract For Differences (CFD) [5] interactions. The system presented in this whitepaper does not attempt to achieve decentralisation, but instead attempts to address some of the drawbacks surrounding existing centralised *stable-coins*. These drawbacks include difficulties regarding the storage of physical or economic wealth, and the increasing likelihood of attacks, as a single entity centralises the entire wealth of the system. Typical *stable-coins* are also subject to fluctuations in the value of their underlying asset. While these fluctuations are usually very small when compared with fluctuations in traditional cryptocurrencies, they are still significant. For example, USDT is subject to the devaluation of USD due to inflation.

In this paper, we propose a stable cryptocurrency system which addresses the aforementioned drawbacks of existing stable currency solutions. Specifically, we propose a new type of token which is not backed by any existing fiat currency or physical store of wealth, but instead is backed by legally binding contractual obligations to provide real-world labour-hours. As such, the system and its controlling entity are not responsible for the centralised storage and management of wealth. Further, the value of an unskilled labour-hour in a particular geographic region naturally adjusts according to economic conditions such as inflation, thereby maintaining the long-term intrinsic value of the cryptocurrency.

This paper is organised as follows: In Section 2 we provide an overview of the system as a whole before discussing the technical details of the necessary system components and processes. Section **??** provides economic considerations in brief, regarding the real-world deployment of this system and its feasibility. Finally, Section 3 discusses future directions and applications of the system and of ChronoBank. The appendix of this document provides supporting reference of several concepts introduced throughout the paper.

## 2. The ChronoBank System

Similar to existing *stable-coins* (such as USDT by Tether and Digix), we propose a centralised entity that coordinates the creation, redemption, and destruction of Labour-Hour Tokens (LHT). We refer to this entity as the ChronoBank Entity (CBE). It is responsible for the acquisition and coordination of legally binding contracts for labour, in addition to the creation and dissemination of LHT. Ultimately the role of the CBE is to ensure the stability of the LHT system through careful management of the system's underlying processes. This section will provide details describing the

proposed processes, practices, and operations undertaken by the CBE and its associates.

The system as a whole is designed with the intent of a single deployment per economic region. For instance, the system could be deployed once in Australia using the value of one labour-hour in the Australian economy, measured in Australian dollars. As this document is an abstract description of the system, it does not refer to any region-specific implementation but instead refers to generalised system parameters that must be tailored for each region. With few exceptions, all processes and structures described in this document may have slight variations in implementation between regions in which ChronoBank operates.

The initial implementation of the CBE utilised the Ethereum[6] blockchain; however, future implementations may tokenise assets on alternative blockchain systems (e.g. Waves [7], Bitcoin [1]) when it is deemed appropriate.

## 2.1. TIME Tokens

In order to fund the development and operation of the ChronoBank system, there was a fundraising phase known as the crowdsale. During the crowdsale, individuals could purchase TIME tokens at a fixed rate. Time Token provides the token holder admittance to the ChronoBank system operations, which means that the Holders of TIME Tokens will extend their possibilities by unlocking the unique functionality available in the system: to create new brand platforms, to create assets and crowdsale campaigns, to Buyback ERC20 tokens, to create and remove wallets, and to vote on important decisions regarding the ChronoBank system.

TIME tokens are developed utilising the Ethereum ecosystem, specifically leveraging the ERC20 token standard[8]. The ERC20 specification is extended to provide the functionality mentioned above; this is discussed further in Section 2.1.2 below.

### 2.1.1. Crowdsale

During the crowdsale, TIME tokens were created as necessary and sold at the fixed price of 100 TIME tokens for 1 bitcoin (BTC). There was no limit to the number of TIME tokens generated during the crowdsale; however, no further TIME tokens were generated after this phase of the project.

All TIME tokens purchased during the crowdsale constituted 88% of the total TIME tokens generated during the initialisation of the ChronoBank system. The remaining 12% of tokens were split with 10% given to the ChronoBank.io team (for ongoing research and development) and 2% to advisors and early adopters of the system.

### 2.1.2. TIME Token Use

ChronoBank provides extensive possibilities to its users. It allows to manage your own *Platforms* and *Assets* that are based on Ethereum ecosystem. *Platforms* act as a base for all token operations as issuing, balance storage, transfer; *Assets* define some custom internal logic to allow implementing different behavior, for example, adding a fee to token transactions.

ChronoBank system doesnt require technical knowledge or a deep dive into it to start use of the system. All the features that are based in ChronoBank can be easily applied if the user wants to. It provides the unique functionality to manage the Assets: easy Asset creation, manage the owners of the Asset, create an Asset Buyback or start a Crowdsale campaign for their Asset. Crowdsale feature has extensive possibilities to sell for ETH, ERC20 tokens, launch external services automating sailing and funds managements from other blockchains, Bitcoing for example. To use these system possibilities there is a need to have a Time Token.

Time Token will allow the users to unlock the system unique functionality by means of deposits in Time Tokens to *TimeHolder contract*. The purpose of *TimeHolder contract* is to keep track of user Time Tokens which are allocated by the user for operations within the system. In most cases Time Token is used as fuel to perform required system functionality. This means that for the use of the functionality users will be charged a fee. Charging will be taken by ChronoBack in Time Tokens that the user previously deposited to the *TimeHolder contract*. Fee value is defined by system administrators that are permitted to manage it. There are the following features that requires fees in TIME tokens during their invocation:

(1) *Create Platform* - The Platform is a central point of user assets management. It provides the possibility to easily and quickly create new Assets.
(2) *Create Assets* (with and without fee) - Assets are ERC20 tokens that are created by users. Users that created their Assets can further operate with them, for example Assets can be Crowdsaled.
(3) *Create token crowdsale* - When users want to Crowdsale their tokens they may create a Crowdsale and get funds in any token registered in the ChronoBack system.
(4) *Create token wallet* - There is a possibility to create two types of wallets: a) multi-signature wallet with given parameters and b) multi-signature wallet with 2 factor authorization
(5) *Create Buyback* - This is the instrument allowing to regulate the market value of the ERC20 tokens. One Buyback is created per one token.

From time to time, the CBE may hold polls on the Ethereum blockchain to elicit the opinion of TIME token holders. Poll results will be incorporated into decisions made by the CBE concerning the financial or technical direction and/or implementation of the CBE system. Only TIME holders are authorized to participate in a poll.

For the Voting feature there is only a need for the user to have a Time Token deposit where the voting weight is calculated according to the rule: deposit amount defines voting weight. No fee will be charged for participation in a poll.

TIME holders may deposit and withdraw their TIME tokens at any time. Withdrawing TIME tokens will influence the voting weight of active polls in which the user participates. When the user withdraws the Time token from the *TimeHolder contract* the voting weight of this user is re-calculated according to the rule.

### 2.2. Labour-Hour Tokens

Labour-Hour Token (LHT) is the fundamental unit of value within the ChronoBank system. The purpose of it is to provide a non-volatile, inflationary-resistant digital store of value on various blockchains. We envisage LHT for utilisation in future systems, such as LaborX. LHT value is non-volatile and inflationary-resistant because it is managed with *BuyBack contract* that inherits buyback process aiming to provide value stability for LHT or ERC20 tokens.

LHT is the main means of payment for people's work in LaborX sidechain, as well as ETH in mainnet. LaborX will be deployed in sidechain which its effective consensus, high performance, low-cost transactions and a progressive reward algorithm for block mining. That allows to scale our current system. It is also important to note that there is no PoW in sidechain - but there is PoS.

LHT will be mined on LaborX sidechain. The miners (validators) will receive LHT for the work of their nodes. To start mining there is a need to make a deposit in TimeHolder. Deposits can be opened in Time or any other ERC20 token. It is important that deposit will play a role of a warranty to provide protection from faulty states and fraud it will be lost by unfair validator once the fraud is detected. Further, there is a need to run our private node with the private key of the account on behalf of which the deposit was made, and it will be automatically allowed to start mining the blocks, getting LHT from the sidechain. LHT can be used as a "fuel" for LaborX. It is also planned to add the possibility of exchanging LHT for ERC20 tokens or ETH in mainnet.

## 3. Future Work

Economic Models. Key to the success of the ChronoBank system is an informed choice of the aforementioned economic parameters. It is essential to perform further analysis so as to determine how parameter modification impacts the feasibility and sustainability of the system in a wider context. This will necessarily be performed before a real-world implementation is constructed.

LaborX. The digital asset management system described in this document is proposed as a first step towards a larger decentralised labour system. LHT as described by this paper forms the base currency for a decentralised labour exchange platform entitled LaborX. The intention of LaborX is to enable peer-to-peer exchange of labour-hours with LHT, thereby reducing the centralisation of the proposed ChronoBank system. LaborX will incorporate a rating system whereby holders of LHT can identify fair trades by examining the quality and/or specialisation of the labour provider, given their history on the platform. By enabling direct exchange of LHT with labour-hours, the system's dependency on contractual arrangements is significantly reduced. This potentially reduces the cost and increases the stability of the system as a whole.

## 4. Conclusion

This paper proposes a non-volatile, inflationary-resistant, digital asset management system. This innovative system is only made possible by recent advancements in blockchain and cryptographic technologies. Leveraging these technologies, this system tokenises contractual debt in a manner that can be both economically feasible and highly practical for digital platforms, such as LaborX.

## References

[1] Satoshi Nakamoto. Bitcoin: A peer-to-peer electronic cash system. 2008.
[2] Tether.to. Tether: Fiat currencies on the bitcoin blockchain. 2014.
[3] Anthony C. Eufemio Kai C. Chng Shaun Djie. Digix's whitepaper: The gold standard in crypto-assets. 2016.
[4] Fabian Schuh Daniel Larimer. Bitshares 2.0: Financial smart contract platform. 2015.
[5] Investopedia. Contract for difference.
[6] Gavin Wood. Ethereum: A secure decentralised generalised transaction ledger. *Ethereum Project Yellow Paper*, 2014.
[7] Sasha Ivanov. Waves whitepaper. 2016.
[8] Ethereum Request for Comments (ERC) 20.