Abstract

Trust Union (TU) is the world's first personal financial relationship and credit asset management service platform based on blockchain technology. It aims to establish an efficient and secure data and value chain for the global financial relationship among individuals (C2C), provide data management and value growth service for personal credit assets. We expect to enable more individual users around the world to enjoy a transparent, secure, reliable and efficient financial relationship, growable and applicable credit assets through our TU's services, thereby enhancing the safety and efficiency of the social financial credit system and achieving the ultimate goal to establish a decentralized, highly autonomous social-financial network.

With rich financial credit system management experience, deep blockchain technology research and development capabilities, the TU project team is devoted to establishing a complete financial relationship management service platform with a Financial Light Smart Contract library (FLSC) as its business core, a Decentralized Credit Rating system (DCR) as its data core, and Multi-level Risk Control system (MLRC) and Global Asset Gateway (GAG) as its valuable extension.

Based on rich application scenarios of personal financial relationships, the TU project team also designed a rigorous Token economic model to build a complete credit eco-autonomous system based on the planned 1 billion TUT tokens.
Contents

1. Project Introduction ........................................................................................................... 5
   1.1 Project Aspiration ........................................................................................................ 5
   1.2 Market Expectation ...................................................................................................... 7
   1.3 Pain Points and Challenges ....................................................................................... 10
   1.4 The Application Value of Blockchain Technology (Blockchain Evolution) .......... 13

2. TU Financial Services and Credit Management System ............................................. 14
   2.1 Panoramic Structure .................................................................................................... 15
   2.2 Financial Light Smart Contract .................................................................................. 17
   2.3 Decentralized Credit Rating ...................................................................................... 19
   2.4 Multi-Level Risk Control ........................................................................................... 20
   2.5 Global Assets Gateway .............................................................................................. 23

3. Technical Solution to TU project ............................................................................... 26
   3.1 Technical Selection .................................................................................................... 26
   3.2 Consensus mechanism .............................................................................................. 29
   3.3 Application framework .............................................................................................. 31

4. Application scenario of TU project ............................................................................. 33

5. Use scenarios of TUT tokens and TM liquid assets ..................................................... 37
6. Asset elaboration ........................................................................................................38
   6.1 Digital asset on sale ..............................................................................................38
   6.2 Distribution and issuance of digital assets ................................................................38
   6.3 Asset usage planning and conditions ...................................................................39
7. Project implementation plan .....................................................................................40
8. Project team ................................................................................................................41
   8.1 Team members .....................................................................................................41
   8.2 Advisory team .....................................................................................................42
9. Risk warning and disclaimer ......................................................................................44
1. Project Introduction

1.1 Project Aspiration

In the fast-growing financial world, financial relationships among individuals have been constantly evolving and enriching, becoming a pivotal part of the financial system. It includes personal lending, personal guarantees, private intermediaries, personal transactions, personal rentals, property distribution, etc. These personal financial relationships have a rich spectrum and generate enormous economic volume. According to a research report of Morgan Stanley, for personal loan alone, its global scale is expected to reach USD290 billion in 2020.

Every C2C (Consumer to Consumer) financial relationship corresponds to credit data. The huge global personal financial relationship network points to the same massive and complex global personal credit system. Real, reliable, accurate and safe credit record data will provide nutrients and soil for the occurrence of financial relationships among individuals and will also become a valuable digital credit asset for individuals.

However, in the current global credit system, B2B (Business to Business) financial relations and B2C (Business to Consumer) financial relations rely on the strong credit endorsement of government, banks and financial groups and institutions. Despite their low efficiency, high cost, complicated procedures and a lack of security, they are still the core of the credit system and the only source of contribution under the overwhelming Internet revolution. In contrast, the C2C personal credit record is seriously missing due to the lack of effective credit endorsement and the inability to bear the high verification cost. As a result, it
has become the credit system’s Achilles Heel while at the same time an untapped market with tremendous business opportunities.

Fortunately, we live in an era when technology can change the world. Internet technology can achieve efficient information circulation and solve the business efficiency problems caused by information asymmetry. In the credit field, the real core is to establish a credit endorsement mechanism with broad consensus and recognition at affordable cost. The heavily centralized endorsement system in the B2B and B2C fields is not applicable to personal financial relations given its lightweight nature. This explains why the revolution of information from the Internet that has been developing for over 20 years still cannot solve C2C financial relations and establishment of the credit system.

We urgently need a new technological revolution to establish a C2C financial relationship and credit system, and the key fulcrum to change the financial world is by the decentralized blockchain technology. Blockchain refers to a distributed database that guarantees the security and authenticity of information through data decentralization, distributed storage, and information that cannot be tampered with. Therefore, the decentralized trust consensus mechanism, intelligent contract machine trust mechanism and value transfer characteristics of blockchain technology have perfectly addressed many pain points of C2C financial relationship and credit system building. For example, the Financial Light Smart Contract Library (FLSC) based on the smart contract algorithm allows users to easily create financial intelligent contracts, which can execute performance bond and enforce default processing automatically, replacing traditional intermediate guarantee actuators with machine algorithms and institutional credit with machine credits accordingly. Another example is the network-wide consensus mechanism credit evaluation system (DCR) that
based on the decentralized storage technology could establish an efficient, low-cost, secure and reliable network-wide credit endorsement mechanism for the entire network and create personal credit assets for the users. For the Multi-Level Risk Control System (MLRC) based on the intelligent contract algorithm innovation, it realizes automated risk control based on data and algorithm, thus reducing the network-wide financial relation risks at a low-cost. Finally, the global personal asset transaction gateway, which established by applying the value transfer characteristics of digital assets, can greatly reduce the transaction cost of financial relations and maximize the efficiency of the whole network.

In summary, TU aims to build a global management and service platform for personal financial relationships and credit assets by adopting the technological advantages of blockchain. It could lower transaction risk, increase matching efficiency, regulate financial relationship and credit asset management to provide effective credit value and transaction guarantee for personal financial relationship. There are still 2 billion people in the world who do not have bank accounts, let alone experience safe and convenient financial services. TU always believes in a global equality. No matter you are in an urban CBD, marginal village or elsewhere, you can still realize the flow of individual financial assets because of global technological innovation. TU pursues this belief and strives to open up the global financial assets circulation channel to improve the global financial ecosystem.

1.2 Market Expectation
C2C personal financial relationships have a rich spectrum and a broad market, and C2C-based personal credit asset management is also a promising market
to be discovered. Such a broad market space and prospects are results of the rapid development of the personal lending market in the traditional legal currency financial world. On the other hand, the incremental development space brought by the emerging digital currency financial market is also a powerful boosting factor.

1.2.1 Size of Existing Global Personal Lending Market

According to Deloitte research data, in 2014, private lending through the personal lending platform reached USD23.7 billion; during this period, the compound growth rate from 2010 to 2014 reached 120%. In 2015, in the US market alone, private lending was valued at USD22 billion, with a compound growth rate of 163.3%.

With regard to research data on the global personal lending market, Morgan Stanley’s research report shows that the global private lending scale will reach USD290 billion in 2020.
It can be seen that in the traditional legal currency financial world, the market size generated by the lending relationship alone has reached hundreds of billions of dollars. Putting this forecasted data into pan-finance relations, the market value of the C2C personal financial relationship system must be of a trillion-dollar scale.

1.2.2 Incremental Market Development Driven by Emerging Digital Currency Financial Market

According to the report of Cambridge Center for Alternative Finance, there are estimatedly 5.8 million to 11.5 million active digital wallet accounts worldwide. The total market capitalization of digital currencies has risen rapidly. Compared with 2016, the market value of digital money has tripled to more than USD 25 billion in 2017.
It is showed that the digital money financial market is developing at an unprecedented speed. The volume brought by this incremental market and the personal credit data generated by it surely cannot be ignored.

1.3 Pain Points and Challenges

As mentioned above, the information transfer technology engenders efficient transmission of information, which breaks down the information barriers of credit and credit loan and establishes a rich B2B and B2C financial relationship as well as the corresponding credit system. Yet, it makes no contribution in the C2C field. Even when referring to the peer-to-peer model, the personal finance actually still relies on the credit centralization intermediary platform of the traditional banking credit system. The essential operating mode is the P2B2P,
still fails to create a peer-to-peer or C2C financial relationship chain in a strict sense. For example, Lending Club, the US Top 1 personal lending platform, has an average interest rate of 6.95% on asset-backed mortgage lending, but over 15% in Southeast Asian countries. Such high borrowing costs are due to the cost of an intermediary platform that provides credit endorsement. The heavy attributes of B2B and B2C financial relationships enable them to bear the cost of credit endorsement provided by third-party credit institutions (governments, banks, financial groups, etc.), while the lightweight nature of C2C leads to the inability of C2C financial relationships to withstand credit cost of traditional models.

The rising cost is just the tip of the iceberg of many flaws in traditional personal lending models. To be more specific, its problems and challenges include:

- **Credit risk**: Traditional financial relationships, including personal lending models, are based on centralized institutions as credit endorsements. Facing such huge benefits brought by the financial industry, it is hard to avoid possible baleful motives or fraud done by banks or intermediate platforms (or their employees) under traditional mechanisms. Therefore, there are major crises and hidden risks in the financial relationship based on centralized institutions. The mode of relying on the national legal machine for supervision does not provide sufficient coverage and guarantee in the lightweight C2C network.

- **Centering cost**: Due to the broken credit chain, most financial services require an intermediary to secure or guarantee for the transaction, such as a bank or personal lending platform. The existence of intermediary often leads to a higher cost. To put it simply, the intermediary profit is added. Moreover, the intermediate platform needs to invest heavily on
infrastructures such as outlets, systems, employees, etc., all of which will be distributed to the upstream and downstream of the chain, resulting in high financing costs.

- Friction cost: Traditional financing chains include lenders, brokers, financing institutions, credit scoring agencies, guarantee institutions, and borrowers. Because the message sent among the organizations is isolated from each other, the parties do not trust the information provided from the message. Therefore, many cross-validation costs are incurred. For example, when the lender requests verifying the credit history of the borrower, and the scoring data from the credit scoring organization, the guarantor’s asset certificate and the authenticity of the information transmitted by the parties themselves needs to be verified again. On the contrary, the guarantee institution’s information on the authenticity of the loan also requires verification. Finally, the distribution of the funds among the parties must also be verified by offline financial personnel. Such mutual verification and the process of trust building is often time and cost consuming, and the end result is an increase in financing costs and a lengthy financing process.

- Inefficiency: Even with the traditional personal lending platform model, except for the automation in online integration, other processes still rely on heavy manual and offline work. In fact, it is not because of the unwillingness of these companies in adopting more information automation methods, but the unreadiness of the traditional model in integrating all parties on a common platform for process automation. The information flow of each party is isolated, and they are reluctant to provide information onto a platform with low credibility.

- Limited mobility: Through global financial data observations, it is not difficult to find that the interest rates of lending across the global market are very
different. In developed countries in Europe and America, the market savings rate is low (annualized less than 1%), and the corresponding loan interest rate is not high (annualized less than 4%) while in Southeast Asian countries, although the annualized deposit income can reach 1.5% or more, the corresponding bank loan interest rate reach 7%, and personal loan rate reaches more than 15%. If the capital could circulate globally, the imbalances of financial regions will be alleviated or broken through the spontaneous optimization of the market, which is beneficial to both borrowers and lenders. Because of the national boundaries of global capital, this wonderful idea cannot come true easily and yet the borderless value flow of blockchains paves the way for this vision.

1.4 The Application Value of Blockchain Technology (Blockchain Evolution)

The technical characteristics of the blockchain perfectly fit the social attributes of global asset circulation. Through the decentralized distributed ledger management, the credit information is put on the chain, which cannot be tampered with. Without the intermediary providing or verifying the information on both sides of the transaction, the true credit information can be retained permanently.

Based on the characterized blockchain consensus mechanism, the record and confirmation of any transaction is based on a common consensus. It eliminates the need for endorsements by centralized institutions such as banks and government. Through algorithm programming, it automatically executes demand matching, performance bond and default handling, in achieving
efficient automation in the entire process.

Its global node distribution promotes long-distance and even cross-border point-to-point direct transactions. It can reduce the frictional resistance in asset circulation, make the market be the decisive force in determining resource allocation, and maximize the benefits of both parties.

To summarize, we need a low-cost, secure, efficient and transparent financial management and asset management service platform. Blockchain carries security encryption, transparency, whole-process value transfer, smart contracts, Dapp support, etc. in its nature. It can optimize and address the market pain points mentioned above, thus creating a new financial experience.

2. TU Financial Services and Credit Management System

Based on the decentralized trust consensus mechanism, intelligent contract machine trust mechanism and value transfer characteristics of blockchain technology, TU will build the world's first personal financial relationship and credit assets management service platform. Taking the personal lending relationship as the entry point, it aims to establish a financial light smart contract library, decentralized credit system, multi-level pledge guarantee system, decentralized investment matching engine, integrated value trading components and global asset gateway, to develop a global integrated decentralized full-process platform, connecting financial institutions and enterprises, and jointly form an infinite C2C financial loop ecology.
2.1 Panoramic Structure

TU has established a complete multi-level business structure for personal financial credit management system, which runs through procedures like contract, credit, risk control, liquidity management, etc.

Dapps application layer: Establish diversified user financial relationship application scenarios, improve the convenience for users to manage financial lending relationships and provide personal credit asset management.

Financial Light Intelligence Contract Library (FLSC): Establish a lightweight, intelligent contract library that provides automated contract management services for a variety of C2C financial relationship scenarios.

Decentralized Credit Rating (DCR): A decentralized credit scoring system formed by a multi-dimensional personal credit data stored in a light smart contract library combined with a TUT token holding mechanism.

Multi-level Risk Control System (MLRC): Provide users with financial relationship management risk control support based on DCR system, multiple intelligent risk control algorithms and risk grading mechanism.
Global Asset Gateway (GAG): Establish a global cross-regional financial relationship ecosystem through built-in value trading components, stable digital assets TM and global asset flow gateways.

Business Panorama:
2.2 Financial Light Smart Contract

The important connection between personal credit relationship management and blockchain is the use of smart contracts handling the performance bond and default process automatically. Therefore, the establishment of each credit relationship will deploy a smart contract. If most of the borrowing smart contracts belong to the same type and nature, with similar conditions for performance bond and default violation, then it is possible to reduce some of the codes, thereby reducing the load on the main chain and costs, and improving execution efficiency. As a result, the TU project reconstructs the smart contract layer, sacrifices the flexibility of smart contracts (but not Turing completeness), but guarantees efficiency, low cost, and fulfillment of the contractual needs in personal credit relationship scenarios. In addition, in order to facilitate the rapid establishment of contracts between the two parties or with a third party, and avoid falling into code-level burden, the TU project pre-builds a smart contract library of various relationship categories for direct selection and deployment for the parties, needless in acquiring any professional programming skills. So what is the difference between TU's light smart contracts and traditional smart contracts? Let's take Ethereum as an example:

<table>
<thead>
<tr>
<th>SC /Feature</th>
<th>Ethereum</th>
<th>TU Network</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programming Language</td>
<td>Solidity</td>
<td>Javascript</td>
</tr>
<tr>
<td>Program Level</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Application Level</td>
<td>Writing from the ground up requires high expertise and it needs at least a few hundred lines of code to deploy a simple logic.</td>
<td>No need for programming, directly generate financial smart contracts through configuration. It also supports multiple security logic interfaces for direct call and implementation of more complex logic.</td>
</tr>
<tr>
<td></td>
<td>Average Consensus Time</td>
<td>Turing Completeness</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td></td>
<td>3-10 minutes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Therefore, in terms of cost, the more streamlined smart contract deployment and call reduces the consumption of gas. In terms of efficiency, the programming-free smart contract configuration can effectively improve the efficiency of the two parties to establish a credit contract. From a security point of view, the pre-defined professional financial contract clauses in the business can effectively prevent unilateral fraud and achieve professional legal protection of the interests of both parties. Due to its reduction on the technical flexibility of the program, it exposes fewer operating interfaces and methods, greatly reduce the possibility of hackers’ attacks.

For example, in a personal lending relationship, both parties can choose a personal loan relationship template from the financial contract library, and input the loan amount, mortgage anchor, time constraint, interest, etc., and the two parties will provide electronic signature for direct deployment. The entire process takes only a few minutes, but the loan relationship has been successfully chained, safely generated and protected.
2.3 Decentralized Credit Rating

Traditional personal credit data is controlled by various giant companies. These data not only be abused, but also be sold, circulated, distorted, and forged by some other illegal organizations, which cause harms to individuals and other parties. The key to promote deeper development of personal financial relations lies in how to manage credit history, credit generation, and credit use with the characteristics of blockchain decentralization and non-tampering. The TU project uses DCR to characterize personal credits. DCR is the core asset module of the project, and all credit indices will ultimately be measured by the number of TU Tokens. DCR is essentially a set of smart contracts, that is, under various preset conditions, it will trigger the allocation and consumption of TUT. For example, you will receive a TUT reward if you repay a loan on time, or be deducted your TUT credit if there is any delay. Furthermore, if you initiate borrowing or lending, TUT will be consumed, the same when an external third party consults your credit. TUT itself can also be used directly for credit mortgage. The DCR contains the following three main modules:

- **Trust-ID**: A unique ID that characterizes a user on the global network of TU projects.

- **Trust-Engine**: With reference to personal identities, fulfillment capabilities, credit history, interpersonal relationships, behavioral preferences, etc., it is used for analysis input and storage of historical credit data, and based on credit generation rules in smart contracts and user performance bond/default behavior, it updates the TU Token.

- **TU Token**: Used to characterize credit value.
2.4 Multi-Level Risk Control

The blockchain reshapes credit relationships among individuals, improves efficiency and reduces costs, but it also brings some risks, since there is no authoritative centralized organization to coordinate or arbitrate between them. The smart contract library is designed to bind the behaviors of both parties by the unchangeable contract. However, except for this part, the behavior agreed upon by the contract itself is also exposed to risk, such as property loss caused by personal borrowing. Traditional risk control model includes four aspects, i.e. collateral risk control, capital use risk control, individual credit risk control and performance capability risk control. Based on the model of the four aspects, in addition to the preset smart contract library and DCR, the TU project provides the best practices for mortgage risk control and fund use risk control: a decentralized investment matching engine and a multi-level pledge guarantee system.
2.4.1 Fragmented Investment Matching Engine

As our ancestors told us that "never put all eggs in one basket", "decentralized investment" is one of the most common ways of risk control. Take private lending as an example, fragmented investment means the capital division of several parts for different borrowers. The matching engine then presents the matching borrower information to the lender in accordance with the lender's requirements and the loan method selected. Therefore, the TU project perfectly explains the open, transparent and efficient features of the blockchain. The lenders can freely choose the borrower, and decide whether to divide his investment or not. This also solves the issue of high investment risk and low investment efficiency in the traditional personal lending industry. For example, if a lender chooses low-risk income for 6-month loan, the engine will conduct an overall evaluation of the credit and mortgage of the borrower before finding the corresponding investment target, then to diversify the investment amount so to minimize the risk. The transparency of blockchain could show the investor a clear money flow.
2.4.2 Multi-Level Collateral

Mortgage guarantees are always a very important part in loan, as the risk management and liquidity of collateral determine the direct risk of the lender. The TU project adopts various methods of mortgage risk management to ensure the security of investors’ funds. First, it recognizes multiple types of collateral. For example, for physical assets, the TU project will work with multiple asset-chained solution companies to directly access the digital asset vouchers of these companies. At the same time, the TU project also supports the collateral of the digital assets themselves. The digital assets are easily bounded to the smart contracts for borrowing. If the value of the digital assets shrinks sharply, the platform has the right to require the borrower to replenish the mortgage or repay the loan in advance. Secondly, apart from the credit of DCR, the platform has the right to reserve 5%-10% of each loan as a risk reserve, in the absence of collateral, if the borrower repays on time, the reserve is returned. If there is delay, the reserve is used for payment. Thirdly, the TU project also supports third-party guarantee institutions to participate in the entire ecosystem, and their income will be paid in Token (TUT and TM).
2.5 Global Assets Gateway

The borderless value chain of the blockchain directly links the borrowing and lending markets in different regions of the world. Due to different interest rates in different regions, different expectations for returns can directly lead to the flow of funds from regions with lower financing costs.

Areas with higher capital costs ease the financing limitations of financially underdeveloped areas. Compared to traditional personal lending, cross-country and cross-regional market demand matching will create new markets.

The imbalance in the development of global financial markets has created conditions for the establishment of global personal financial relationships, but due to the borderline nature of the local currency itself, it is necessary for TU to create a globally seamless flow of assets and asset management methods: integrated value trading components, global asset gateways, and global liquidity assets.

2.5.1 Components of Integrated Value Exchange

The asset pledge of the TU project accepts the pledge of various forms of assets, including the pledge of digital assets, while subsequent asset flow also needs to be redeemed at any time. Therefore TU integrates a digital asset trading component, and users can realize the exchange between legal currency and digital assets at any time. The implementation of smart contracts also requires the disposal of digital assets by performance bond or default or by legal currency conversion.
2.5.2 Global Assets Gateway

Due to the regional imbalances in the global personal lending market, such as the low interest rate capital in the US and the high lending interest rate market in the Asia Pacific region, the personal lending program with global liquidity is more competitive because one can get loan at a lower cost with higher asset-end benefits. However, the flow and cross-border settlement of the global legal currency market is time-consuming and costly. This is the advantage of the blockchain personal lending solution, with the help of the global liquidity assets (Liquidity Token), funds can flow quickly and efficiently. For example, we will set up an asset gateway in each country or region. The role of the asset gateway is to pledge the user’s legal currency and release the corresponding digital current assets. The digital current assets are anchored on equivalent legal currency. Such asset can be used for personal loan on a global scale to generate revenue.
2.5.3 Global Liquid Assets (Trust Money)

As explained above, one of the biggest advantages of the blockchain is its borderless value network. To realize the vision of optimal allocation of global financial resources, the TU project decides to introduce Liquidity Token - Trust Money (TM), and TM is anchored with USD in 1:1. Global users can directly use TM for global personal loan investments after the exchange of TM through the asset gateway. Global borrowers can also obtain financing by obtaining TM at their home asset gateways. Moreover, the generation of TM is a decentralized contractual behavior, and is always anchored with the corresponding legal currency, so it is completely risk-free. At the same time, in order to ensure the rigidity of the asset correspondence, the TM transaction does not consume the TM itself, but only consumes a very small amount of TUT.
3. Technical Solution to TU project

3.1 Technical Selection

With the continuous accumulation of digital assets in Ethereum and the decentralized application of various smart contracts, the TPS of Ethereum has been greatly reduced and the consumption of Gas has been gradually increased, which has greatly increased the operating cost of Dapp. The Solidity programming language used by the Ethereum developer is not friendly, resulting in long application development cycles and high costs.

The development and operation process of a Dapp on Ethereum is demonstrated in the above chart. When the Solidity language is compiled into Raw, the contract can only be deployed on the Ethereum. Each Dapp front-end call consumes node performance, Gas and brings security risks.

Stellar uses an improved BFT (Byzantine) protocol that uses node set data validation to improve validation efficiency and reduce costs. With the absence of the smart contract layer, the network load is relieved, leading to higher...
efficiency and lower cost.

The ecological structure of the stellar network:

Although Stellar was originally based on the Ripple global payment network evolution, after several versions update, it has gradually evolved into an ecosystem similar to Ethereum. Although it lacks the smart contract layer, we can still quickly develop decentralized application based on Stellar.

Stellar Core is the core ledger of Stellar core. You can choose it as the Stellar ledger node, or you can use the global nodes of the current Stellar to achieve data distribution and consensus verification. Horizon is Stellar's API server, providing RESTful HTTP API visits, which greatly reduces the access coupling of decentralized applications. Of course, you can also create your own services to deal with Horizon's access load. For example, the release of MOBI is a big challenge for Horizon and Stellar Network. If the application has high concurrency needs in the future, this will be a bottleneck. Moreover, as the size of the network grows, even with the confirmation of the set distribution, the convergence rate of data consistency will be slowed down.
The TUBB - TU Blockchain Baseline system builds a light smart contract layer based on the Stellar’s Ledger layer and implements the service and application layers outside of the chain. This will not only make it compatible with future large-scale network performance, but also support rapid application development and integration.

TUBB Network Ecology Diagram:

As shown in the above figure, the smart contract template service and API service layer can be achieved through direct call outside of the chain, so that the decentralized application and other applications can be compatible to obtain TUBB services.

Compared with Ethereum, the underlying blockchain solution adopted by the TU project has the following characteristics:

a. Ethereum is a complete Turing system that supports the implementation of complex Smart Contract layers, but it leads to problems such as data redundancy and slow consensus confirmation. The TU project requires quick confirmation of rights verification, circulation and payment of assets.
At the same time, the business logic of the TU project does not need to introduce complex smart contracts which lead to the system's efficiency reduction and potential security risks. At present, the time needed for Ethereum transaction confirmation is 5 to 10 minutes, while the TU system only needs 5 seconds to confirm a transaction. At the same time, due to the mining consensus mechanism of Ethereum and the current price of ETH, the execution of each transaction and smart contract will cost a lot, while the TU system only needs to consume TUT almost negligible each time, which greatly reduces the application development and operating costs.

b. Compared with Ethereum's ERC20 protocol, TUBB is more convenient in release, and it comes with KYC and Token management system. It supports Token segregation, freezing, multi-signature and other complex functions to support the expansion of future business scenarios.

c. The abuse of Ethereum has exposed too many security risks and performance bottlenecks. In particular, once deployed, smart contracts are likely to cause huge losses if without a thoughtful plan, while TUBB has sufficient autonomy.

d. The TUBB system comes with a decentralized value trading component. Before the third-party exchange, all users holding digital assets can trade directly in the wallet, supporting future transactions in their own systems even without third-party exchanges.

3.2 Consensus mechanism

There are plenty of researches on the consensus mechanism, and various consensus mechanisms have been proposed, among which POW, POS, DPOS, etc. are more famous. POW consumes computing power and consumes energy,
but the system is relatively secure. Although POS does not waste energy, its
security performance has not been recognized, and there is some controversy
about its fairness. The TU project is based on stellar construction and uses an
improved Federated Byzantine Agreement. Unlike most consensus protocols, it
has four key attributes, i.e. decentralized control, flexible trust, low latency and
progressive security. As a Federated Byzantine Agreement, this consensus
agreement guarantees security in the face of irrational behavior, requiring only
limited computing resources and reducing the barriers to entry. The following
chart compares various consensus mechanisms:

<table>
<thead>
<tr>
<th>Consensus mechanism</th>
<th>Decentralization</th>
<th>Low latency</th>
<th>Flexible trust</th>
<th>Progressive security</th>
</tr>
</thead>
<tbody>
<tr>
<td>POW</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POS</td>
<td>✔</td>
<td>Possible</td>
<td></td>
<td>Possible</td>
</tr>
<tr>
<td>Byzantine</td>
<td></td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Tendermint BFT</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>Stellar Consensus</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>

Flexible trust means that users are free to trust any combination of participants
who believe they are appropriate. Progressive security, security is based on the
digital signature and hash family, and its parameters can be adjusted
according to the actual situation to defend against opponents with powerful
computing power. Just imagine that the length of the password can increase as
the attacker’s computing power increases.
3.3 Application framework

The TU project uses a six-layer structure to serve users and third parties:

3.3.1 Base layer (Ledger layer + Bridge Server layer)

The block layer is composed of blockchain nodes, and is mainly responsible for transaction broadcast, consensus algorithm, identity authentication, data storage and other functions, and can achieve high availability and elastic scalability through node expansion. At the same time, the digital asset issuance system based on the TU project runs TU generation, issuance, and distribution rules. Meanwhile, the object of the application database is written to the ledger in an asymmetric encryption manner. For security and performance efficiency considerations, we will build our own TU Core node and consider building our own Bridge service later.
3.3.2 Service layer (TU service layer + algorithm distribution layer)

The final output of the service layer provides credit service, direct loan matching, liquidity, data and other service-oriented RESTFUL API interfaces. The API interface of the TU project follows the principles of simplicity, security, versatility and extensibility. The TU project platform service layer provides various business functions such as transaction agents for third-party application invocation and integration. The algorithm is responsible for asset decomposition, encapsulation encryption, contract binding, and interest rate calculation output for the data of the scheduling service.

3.3.3 Application layer (APP layer + Other web application layer)

The application layer, which is above the service layer, provides users with business functions such as credit query, mortgage confirmation and asset exchange as well as related applications of digital assets through TUT. By using TUT, users can view credit acquisition liquidity on commonly used terminals or initiate related business queries and transactions.

The application framework is shown below:
Application development configuration table:

<table>
<thead>
<tr>
<th>Module</th>
<th>Technology</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front desk</td>
<td>AngularJS/AXBB Web3</td>
<td>1.6</td>
</tr>
<tr>
<td>Backstage</td>
<td>NodeJS/Drupal</td>
<td>6.21</td>
</tr>
<tr>
<td>Page application</td>
<td>Swift/Android/JavaScript</td>
<td>---</td>
</tr>
<tr>
<td>Application database</td>
<td>MySQL</td>
<td>5.5</td>
</tr>
<tr>
<td>Transaction database</td>
<td>MongoDB</td>
<td>3.2</td>
</tr>
<tr>
<td>Server software</td>
<td>Apache</td>
<td>2.4</td>
</tr>
</tbody>
</table>

4. Application scenario of TU project

4.1 Personal credit loan

By paying the TUT token, the borrower can call the credit loan contract of the light smart contract library to establish an unsecured credit loan relationship based on blockchain storage and smart contract management with the lender, and agree on the borrowing balance, period, interest rate, repayment method and other information in the contract. Borrowing assets can be transferred in a variety of ways, including:

1) Offline legal tender transfer;

2) Transfer through the asset gateway with the corresponding number of TM tokens;

3) Transfer money in digital currency wallet in digital currency (BTC/ETH/TUT);
4.2 Personal mortgage loan

By paying the TUT token, the borrower can also establish a mortgage lending relationship based on the multi-level mortgage management system with the lender. In the early stages of project implementation, the collateral will be dominated by digital currency assets, supporting BTC/ETH/TUT as collateral, and conduct collateral’s mortgage-release and repayment order through smart contract automation.

4.3 Personal assets and debt management

TU will establish a dedicated asset and debt management center for each individual user. At the management center, users can easily manage personal creditor lists, debt recovery progress, or personal debt lists and debt settlement progress reminders to improve user repayment punctuality and credit evaluation.

4.4 Credit asset flow

TU stores each user’s loan contract in a chain, which makes each contract unique and tamper-resistant, and realizes the contractual claims. Users with unexpired claims may choose to transfer the claims to a third party when they have a tight budget, so that the loan is recovered in advance. The transfer operation is also managed through smart contracts to ensure the irreversibility of operations. We believe that the capitalization of claims through blockchain technology will increase the liquidity of debt assets, which will greatly increase the probability and efficiency of the transactions between the borrowers and the lenders.
4.5 Personal credit management

TU establishes an independent DCR credit evaluation system for each user through user financial contract performance, multi-dimensional personal information and third-party authoritative data sources. The corresponding management scenarios include:

1) Inquiry: By paying the TUT token, and under the premise of the user's own consent, other users (such as lenders) will have the right to inquire about their DCR credit rating, thereby deciding whether or not lending their money.

2) Protection: Users enjoy the full ownership and the right to use of personal credit assets. TU will guarantee the transparency and security of this feature from the algorithm level. Any individual or third-party commercial organization’s credit inquiry to the user must obtain the user’s own authorization.

3) Added value: Third-party commercial organizations need to pay certain TUT tokens for the user’s credit inquiry, in addition to the user’s authorization. A portion of the payment amount will be used as a platform service fee, and the rest belong to the user. The amount of TUT tokens paid per query will be determined based on the value of the user's credit data. Therefore, the more contract transactions and compliance actions that users generate in TU, the more value-added rights they will enjoy with their credit assets.

4.6 Cross-regional financial relationship demand matching

TU’s unique risk control system and asset gateway system have made it possible to match cross-regional financial relationships:

1) TU will use the DCR credit evaluation system to make a match of borrowers and lenders with high-quality credit ratings to improve the financing
and investment efficiency of both borrowers and lenders.

2) The establishment of a multi-level risk control system will provide auxiliary support and guarantee for the security of the loan relationship.

3) Asset gateway and TM digital assets enhanced the efficiency and security of cross-regional financial relationships.

4.7 Credit data value growth alliance

As one of the contributors to the credit data ecosystem, TU will establish a credit data value growth alliance:

1) Joint credit data producers (users) and users (commercial organizations) establish an ecosystem of data value growth.

2) Cross-chain data alliance: Based on the alliance chain, the credit data sharing value between different chains is created, such as enhancing the risk resilience. The cooperation of different chains will generate new costs and profits and form new revenues.

4.8 BAAS (Blockchain as a Service) platform for service financial institutions

Despite its positioning as a financial relationships and credit asset management platform for individuals, TU also hopes to provide financial service institutions with the complete financial management capabilities that have already been established that are faced with similar pain points (such as loan companies, mortgage agencies, guarantee companies, etc.) to enhance the efficiency and effectiveness of their financial relationship management. Through BAAS platform, TU will also involve more users from financial service institutions,
thereby accelerating the building of a broader ecosystem of personal financial relationship.

5. Use scenarios of TUT tokens and TM liquid assets

5.1 About TUT tokens

The number of TUT tokens reflects the credit index of the Decentralized Credit Rating. In principle, all risk-increasing operations will consume some TUT, and all risk-reduction operations will acquire some TUT.

TUT income:
1) Perform financial contracts (repayment on time, etc.);
2) Provide sufficient collateral; timely collateral cover-ups;
3) Generate loan contracts;
4) Credit queried;
5) KYC certification; multi-dimensional credit information perfect;
6) Ecological incentives (sharing and active);

TUT expenditure:
1) Failure to perform financial contracts (deferred repayment, early repayment, etc.);
2) Failure to provide sufficient collateral and cover-ups in a timely manner;
3) Generate loan contracts;
4) Query credit;
5) TM transaction
5.2 About TM liquid assets

TM is a 1:1 US dollar reserve token. Users can purchase TM at the current exchange rate based on the various legal currencies they hold. It can also be exchanged for US dollars or exchanged at the current exchange rate for the selected legal currency. The TM token acts as a value measure and a global circulation function. Its birth and death occur only when it is exchanged with the legal currency, and the TM is not consumed and generated in all aspects of the transaction.

6. Asset elaboration

6.1 Digital asset on sale

The Trust Union project will issue Platform Digital Assets (TUT) with a total circulation of 1 billion, and guarantee there will not be any additional issuance.

For TUT sales conversion ratio, please kindly note for the announcements on the official website.

6.2 Distribution and issuance of digital assets

<table>
<thead>
<tr>
<th>Identity</th>
<th>Proportion</th>
<th>Usage &amp; Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foundation</td>
<td>20%</td>
<td>Used for community construction and ecological construction development.</td>
</tr>
<tr>
<td>Founding team</td>
<td>15%</td>
<td>Incentive rewards for team formation, talent introduction and team operation management. Used for the core personnel of the founding team; the efforts and contributions during the development process. The manpower,</td>
</tr>
</tbody>
</table>
material resources and intelligence invested in the process of project design, resource formation and business environment incubation.

12-24 months of locked position period:
Unlock 5% in the 12th month;
Unlock 5% in the 18th month;
Unlock 5% in the 24th month;

<table>
<thead>
<tr>
<th>Ecological incentive</th>
<th>40%</th>
<th>Used to motivate users’ active use behaviors and behaviors that are conducive to ecological development.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market collaboration</td>
<td>5%</td>
<td>Used in the ecological construction of TU global market strategic partners. Used for resources input in the process of developing partners, institutions, third-party services, enterprises and processes.</td>
</tr>
<tr>
<td>Targeted private placement</td>
<td>10%</td>
<td>Used for the targeted private placement of TUT tokens.</td>
</tr>
<tr>
<td>Cornerstone and committee investor</td>
<td>10%</td>
<td>Cornerstone and committee investors’ early-stage investment. 3-12 months of locked position period</td>
</tr>
</tbody>
</table>

6.3 Asset usage planning and conditions

The TU project team always follows the principle of open and transparent use of assets, insists on the traceability of all asset use, and regularly updates and reports to the community.

TU also ensures that most tokens have locked position requirements.
7. Project implementation plan

<table>
<thead>
<tr>
<th>Time</th>
<th>Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 2018</td>
<td>Improve and publish commercial white paper;</td>
</tr>
<tr>
<td>August 2018</td>
<td>Start technology research and development;</td>
</tr>
<tr>
<td>August 2018</td>
<td>Dapps prototype and design release;</td>
</tr>
<tr>
<td>September 2018</td>
<td>Token release;</td>
</tr>
<tr>
<td>September 2018</td>
<td>Start directional private enlisting plan;</td>
</tr>
<tr>
<td>October 2018</td>
<td>Dapps V1.0 release;</td>
</tr>
<tr>
<td>October 2018</td>
<td>Global targeted private placement</td>
</tr>
<tr>
<td>November 2018</td>
<td>Access exchanges;</td>
</tr>
<tr>
<td>January 2019</td>
<td>Dapps V2.0 release;</td>
</tr>
<tr>
<td>February 2019</td>
<td>BAAS System release;</td>
</tr>
<tr>
<td>April 2019</td>
<td>Dapps V3.0 release;</td>
</tr>
<tr>
<td>July 2019</td>
<td>Establish credit data value growth alliance;</td>
</tr>
</tbody>
</table>
8. Project team

8.1 Team members

CEO: Markus Patrick CHAN

CTO: Keith YAU
One of the community heroes recognized officially by Global Amazon AWS. Expert of CSDN Technology Community Amazon AWS Cloud Computing. China Amazon AWS cloud computing user community organizer. Core member of the Apache Kylin (Cloud), the top Apache Foundation project. Head of China Open Source Drupal User Community. Graduated with a degree of Information Engineering from the Chinese University of Hong Kong.

COO: Chao LONG
With 17 years of experience of software and Internet operation, Long worked in GDNT, Ericsson, YY as Technical Director, and as operation leader in Internet education platforms. He has extensive experience in application development, operation and promotion. Bachelor of Computer Science and Technology in Huazhong University of Science and Technology.

Co-founder: Stone YU
With more than 10 years of experience as a senior executive in the financial industry, Yu worked in Europe, China and Hong Kong for StateStreet Bank and Trust, Standard Chartered Bank and HSBC. PE, Hedge fund and Mutual fund’s hosting and fund administrator services expert. Master, University of Wales.
8.2 Advisory team

Tony FUNG
Chief Executive Officer of an asset management company of a Hong Kong listed state-owned enterprise. 15 years of experience in asset management industry, among the first professionals to participate in Chinese QDII overseas investment. Extensive practical experience in IPO, Hong Kong stocks and US stock investment. Bachelor of Economics, Hong Kong University of Science and Technology. Master of Philosophy in Economics and Finance, City University of Hong Kong.

Kenneth LEE
The Chief Executive Officer of Four Directions Co., Ltd., a well-known technology company in Hong Kong. He has extensive experience in the information technology industry and provides blockchain ideas and technical guidance for different companies. He is also the president of the Hong Kong E-sports Association, member of Hong Kong Elite Club and China Youth Science and Technology Workers Association. He works in Hong Kong Internet Industry Association (iProA) as Executive Director, and is key member of Hong Kong I.T. People’s Association (ITPA) (Hong Kong Federation of Trade Unions).

Chris Dwyer
Instant Global Payment CEO.
Ripple Australia Gateway representative and opened up the London, Malaysia and Indonesian ripple gateways.

Benny TSE
Co-founder and CFO of Sparticle Group.
15 years of experience in the field of financial investment.
U.S. registered management accountant.
Chartered financial practitioner certification.
Part-time lecturer in financial management during university.
Master of Finance, University of Michigan.
MBA from Victoria University of Wellington.
Chairman of the Hong Kong Baptist University Doctor of Business Administration.
Tao CHEN
Over 10 years of experience in risk management and modeling, CFA certified. He has worked for RWE, Germany’s second largest energy group, LCH, the UK’s largest trading clearing house, Merrill Lynch and UBS. He is the Director of Quantitative Risk in London Metal Exchange. Chen has a deep understanding on The Basel III Accord, and financial supervision such as EMIR and MiFID II. He is also responsible for risk management communication among the Exchange and the Bank of England and the European Securities and Markets Authority. Bachelor of Computer Science of Beijing University of Aeronautics and Astronautics and Master of University of Warwick.

Arthur YU
Founder of the Cybervein Project.
Deputy Director of the Cybervein Laboratory of Zhejiang University, focusing on Blockchain Technology and Blockchain Finance research.
Former CEO of Qianhai Yuncheng Co.,Ltd and analyst in J.P. Morgan London Tech. Bachelor of Computer Science in Imperial College London.
9. Risk warning and disclaimer

Dear supporters of the TU project, please read the TU project business white paper carefully to fully understand the potential risk and the technical characteristics of the TU project, and fully consider your risk tolerance for your rational decision-making. All of the above information and analysis does not represent any investment advice, investment intentions or instigation investment. It does not constitute or be construed as any offer or invitation to invest, nor does it constitute any form of contract or commitment.

The TU project team now clearly indicates that the relevant intended users have a true and clear understanding of the risks of the TU and TU platforms. Supporters, participants, investors once independently choose to participate in the investment, which indicates that they fully understand and accept all risks of the project, and they personally voluntarily bear all the results and consequences.

The TU and TU project platforms are decentralized products under the blockchain technology framework. The two parties should not understand and define the TU and TU project platforms as a centralized legal agreement between the two parties. TU is not any ownership and control.

The TU project team expressly states that it will not bear any direct or indirect losses caused by participation in the project.

We cannot guarantee that the digital assets (TUT) of the TU project will certainly increase in value, and in some cases there is also the possibility of a decline in value. Participants who do not use TUT correctly and reasonably may lose the right to use TUT or even lose their owned TUT. TU project digital asset investors
should understand that the project party will not be liable for a refund under any circumstances.

The TU project team will manage the project reasonably and in accordance with the content of the white paper disclosed. Although the TU project team will perform its duties and fulfill its obligations of honesty, credit, diligence, and conscientiousness, supporters also have a risk of loss. There may be other risks such as policy risk, economic cycle risk, cyber hacking risk, management risk, liquidity risk and so on.

Declare again: Due to accidents, irresistible factors and changes in national laws, regulations and policies, we will be exempt from any loss caused by the dissolution and liquidation of the project and project team in accordance with laws and regulations, and will not bear any responsibilities.
Contact Us

Official Website: www.tut.credit
Email: customerservice@tut.credit