TRUSTUNION

TrustUnion
White paper

The future of human cooperation

WIP

EXECUTIVE SUMMARY

A new economic paradigm has emerged from the growing Sharing Economy based on consumer need for Trust and Security in transactions. The new Trust Economy is a natural evolution of the sharing economy, where services are provided in a trustworthy environment. The emergence of Distributed Ledger technology has made it possible for peers to access an intimate level of understanding between each other. Without a secure and reliable way to evaluate the trust in the consumer to business relationship, buyer or seller risk makes trustful trade impossible.

Nearly every digital economy has some manner of imparting trust to buyers through reputation, whether that be user-generated review scores or brand awareness. However, trust cannot be earned through reputation alone. Reputation is just as liable to manipulation as anything else.

The global digital engagement score is a representation of consumer perception of the digital economy. Global digital engagement is currently just 45 percent[1], demonstrating a widespread lack of trust. Enhanced transparency is essential to the future of digital economies. Consumers must be able to assess the risks involved in transactions – faulty or unreliable data and fraudulent data sources are often used to represent customers or service providers. Changing the global perception of digital economies means improving and redefining trust.

Trust in a transactional setting is a multilayered concept with many key components.

Digital economies must meet the trust requirements of their users in every possible market encounter. To achieve this digital economies must clearly define the kind of trust market participants seek, as well as provide tools that ensure all transactions are executed with the utmost degree of trust.

TrustUnion will shape the future of human cooperation by establishing an ecosystem of Trust-as-a-Service (TaaS) applications.

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1   https://www.edelman.com/sites/g/files/aatuss191/files/2018-10/2018_Edelman_Trust_Barometer_Global_Report_FEB.pdf

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1 BACKGROUND AND MOTIVATION

1.1 Enabling the trust economy

The peer-to-peer economy responsible for boosting the prosperity of the digital economy is rapidly becoming a stranger-to-stranger economy. Large-scale data breaches such as the Equifax and Cambridge Analytica hacks have created an economy in which mistrust is the norm.

Trust has played a crucial role in every economic interaction for centuries. The rise of digital technologies has broken the barrier of geographic boundaries. It's now possible to trade with anybody around the world, but not possible to access the full complexity of real-life trust in the digital environment. The stranger-to-stranger economy requires trust solutions that remove the risk and vulnerability present in trades between strangers.

Blockchain technology delivers trust and transparency. Distributed Ledger Technology (DLT) ensures that all economic interactions are recorded in an immutable, verifiable, tamper-proof manner. Blockchain technology allows stranger-to-stranger economy participants to interact regardless of a mutual lack of knowledge. Distributed Ledger Technology (DLT) enables a new digital-trust based economy – the Trust Economy.

The Trust Economy is the next evolution of the Sharing Economy.

TrustUnion will bring the Trust Economy into the digital environment by enabling an ecosystem of Trust-as-a-Service (TaaS) applications.

1.2 Requirements for safe and trusted online usages

Secured Trust Management systems are built to provide services and products that bring more trust into digital services and bring a higher level of consumer protection. Such platforms need to meet the following requirements:

- **Global usage** – Ensure millions of users can use the platform through scalability-focused design;

- **Privacy** – Ensure each user maintains control over their own data;

- **Data ethics** – Data must be shared responsibly, transparently, and frugally in order to protect users;

- **Unforgeable system** – Guarantee the system provides unbiased, verifiable and immutable services;

- **Feature-rich** – Ensure the platform enables developers and clients to propose features in their services and products that are equivalent or better than existing counterparts

- **Community-owned** – Provide a democratic and fair system that promotes transparency and ensures trustworthiness. The platform must leverage network growth effects without negative 'extraction imperative[2]' impact;

- **No central authority** – Establish a decentralized governance system that prevents centralized control or manipulation;

1.3 Redefining trust

Trust is essential in any economic system. The widespread adoption of the sharing economy has created a highly inefficient model of trust management. The current Trust paradigm reduces trust to a simple reputation system. In most cases this model is a simple five-star rating or user reviews system.

Trust is more complex than a reputation system

Accurate Trust is too complex for basic reputation models. Counterparty risks are present in every economic system. Individuals are placed in uncertain transactional relationships in almost every case. The web ecosystem, is able to streamline peer-to-peer interactions but removes third-party governance. Traditional trust models need third party trust to prevent malicious behavior.

Economic digitization needs a trust model that incorporates and adapts to the nuances of interpersonal trust. The need for cooperation is growing in parallel with the digital economy as individuals struggle to transact across geopolitical borders.

Optimistic assumptions on social dynamics predict that individuals are conditioned by their upbringing to always meet the obligations they choose to undertake. The reality of interpersonal commitment and fulfillment does not always reflect this. Modern economic systems guarantee trust via legal mechanisms. These mechanisms are enforced by government intervention.

Trust-by-authority cannot always function as a guarantee of positive interpersonal behavior online.

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2   https://medium.com/public-market/the-future-of-network-effects-tokenization-and-the-end-of-extraction-a0f895639ffb

⬡ Trust incorporates elements of vulnerability, risk, expectation, and uncertainty.

Trust has traditionally functioned as the solution to managing risk in interpersonal relationships. Trust functions as a difficult-to-define aggregate of social capital and individual transaction history. The intangible nature of Trust has made it an economic element that relies upon authority for enforcement.

Opaque interpersonal relationships, physical distance, and the lack of familiarity between individuals makes traditional trust models ineffective in modern society. .

Trust is defined as a state or precondition wherein a person has a belief in the reliability, truth or ability of someone or something to undertake or perform a given task or objective. Trust, therefore, incorporates elements of vulnerability, risk, expectation, and uncertainty[3].

Existing reputation systems do not provide enough insight into the identity, behaviors, and potential future actions of any given individual. Contemporary reputation systems rely on the honesty and active participation of the stakeholders.

Contemporary reputation systems are susceptible to manipulation. Fraudulent sellers or buyers orchestrate fake reviews or ratings in reputation-based economic systems, eroding user trust.

⬡ Redefining a New System of Trust

A new trust model must be created that takes into account the various inherent qualities of trust. This system should posses the following characteristics:

› A trust relationship between two persons or entities should take into account the historical and current trust status of both parties.

› Individuals or parties should be able to transact without sharing sensitive information. Trust systems must facilitate trust without compromising privacy.

› A trust system must incorporate assumed risk by reflecting the amount of risk undertaken between two parties that are not known to one another.

› Trust must be enforced by the threat of incurring a penalty. Penalties enforced by the system may be executed in either reputation or economic form.

› Trust systems must establish an escrow system that ensures a fair method of resolving disputes.

1.4   Motivation for a Blockchain protocol solution

TrustUnion uses peer to peer technology that disrupts the way we share and store information called Blockchain. TrustUnion is supported by its own protocol to gain the following advantages:

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3   The Cost of Trust: a Pilot Study, July 2018, Sinclair Davidson, Mikayla Novak, Jason Potts

Immutable records of transactions to certify past and current user activity: TrustUnion is powered by TrustChain. This network of member nodes drives two different and complementary scores, representing trustworthiness. TrustChain is able to evaluate these scores based on the transactions performed by each member. The data used to establish these scores must be tamper-proof and impossible to forge. Blockchains are able to maintain immutable records, but can be compromised. TrustUnion possesses its own transaction layer to ensure reliability.

Smart contracts promote transparency: TrustUnion uses smart contracts to save the states of complex transaction functions, ensuring the algorithm used to process these states cannot be tampered with. These Smart contracts can be audited, promoting transparency within the TrustUnion system. Transparency is critical in the context of a Trust-based system.

Distributed digital ledger reduces the cost of trust: Trust management isn't cheap. Distributed Ledger Technology delivers a tamper-proof record of trust that can be verified by all parties.This significantly reduces the operational cost of trust.

2 OVERVIEW OF TRUSTUNION

2.1 What is TrustUnion?

TrustUnion offers developers and businesses ability to implement different levels of trust-enabling services into their products. Individuals and businesses can use TrustUnion to transact in the comfort of a trusted and secured network.

TrustUnion's enables the Trust Economy by establishing a Trust-As-A-Service application eco-system. This ecosystem uses distributed ledger technology to manage a trust platform, allowing products and services to provide different trust mechanisms. TrustUnion's TaaS can be used on the web, mobile apps, or with any blockchain-based application.

TrustUnion delivers the technologies, products and services that digital economies need to evolve. Future digital economies need the ability to create granular trust-based products and services. TrustUnion makes the Trust Economy possible.

Trust is complicated. TrustUnion encompasses the complex system of interpersonal Trust and simplifies it, establishing a secure and autonomous trust ecosystem for digital economies.

TrustUnion is composed of the following elements:

> A record of the interaction history between two parties – TrustPath

> An evaluation of the risk for transacting or interacting with any party based on accumulated trust data – TrustScore

> A system that ensures that the outcome of transactions cannot be altered or obfuscated, while ensuring the fair resolution of disputes – TrustPay

> A system that allows individuals or entities to obtain confirmation of identity or ownership information on other parties without disclosing their personal or private data – TrustPay and TrustUnion Accounts and Usernames, TrustUnion Data Management

TrustUnion's customers are regarded in this document as TrustUnion Affiliated Marketplaces. TrustUnion customers include marketplaces, websites, mobile apps, decentralized apps and global ecosystems in which where peers interact to provide or be provided with a service or

product. TrustUnion is able to provide new levels of Trust to users of platforms such as eBay, Airbnb, Etsy, Craigslist, Wag, Tinder, Uber, ZocDoc, Trulia or NextDoor.

TrustUnion's Secure Trust Management System includes a robust TrustChain protected and backed by the TrustUnion Network. This system secures and empowers clients with flexible, high granularity trust services

TrustChain is the core of the TrustUnion Secure Trust Management system and TrustUnion services. These services include TrustScore, a reputation system based on past verified behavior. Other services, such as the TrustPath score, provide insight into potential trust between peers.

Any Trust Management System is incomplete if not secure on all layers. TrustUnion operates on a fully secure TrustUnion Network to ensure necessary security management.

The TrustUnion Network is a next-generation peer-to-peer network that rewards block validators for securing the blockchain. Block validators participate in consensus, while masternodes are rewarded for providing processing resources or offering decentralized value-added services to users.

These decentralized value-added services can include:

> TrustUnion Token (TUN) transactions

> Username and pseudonymous identities

> Identify verification

> Storage capability

> Privacy mechanisms

> Governance mechanisms

The TrustUnion Network is designed to provide maximum protection and robustness to the TrustChain and TrustChain services.

## 2.2 The TrustChain – the heart of the system

2.2.1   What is the TrustChain?

TrustChain is the core of the TrustUnion Secure Trust Management system.

The TrustChain is a peer-to-peer network of member nodes. Each node represents a TrustUnion member, represented by both a TrustScore and a TrustPath value relative to another node. A TrustUnion member is defined as an individual or company who has created an account on TrustUnion.

Both the TrustScore and the TrustPath value help members to assess if they can trust another member. TrustScore and TrustPath help members obtain trust when transacting. These transactions can involve buying or selling a product or a service, renting or lending an equipment, or any other trackable digital interaction.

a. The TrustChain is a completely de-centralized reputation network pro-tected against bias. TrustChain digi-tizes real-life trust.

b. Users are connected to a limited num-ber of people who they know and trust in the real world.

c. Different sharing economy, peer-to-peer and e-commerce transactions are recorded on the network.

d. Each user's reputation affects the reputation of the people they are connected with. The TrustChain self-regulates, autonomously identifying and eliminating bad actors.

e. TrustChain provides users with ownership over their reputation.
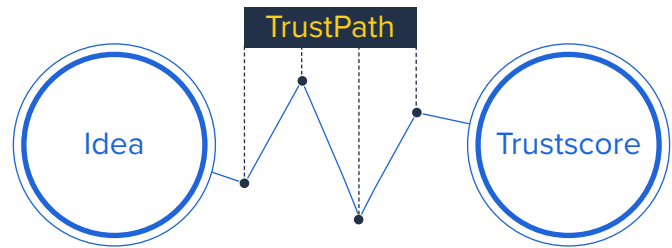
2.2.2 Past and Current Reputation vs Assumed Future Behavior: TrustScore vs TrustPath
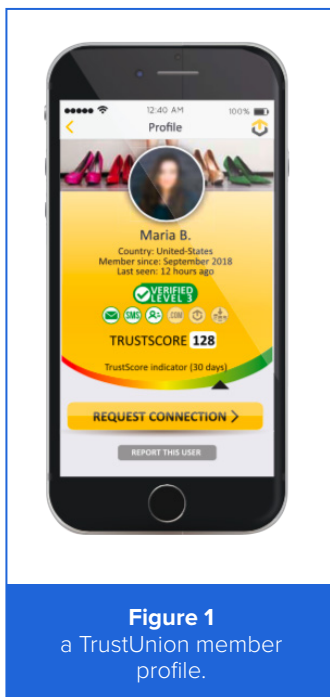

Figure 1
a TrustUnion member profile.

As outlined in section 1.3, Trustunion possesses two distinctive reputation mechanisms:

❯ Reputation based on past and current validated, unfalsifiable, and unbiased transaction outcomes

❯ The assumption of future behavior based on the reputation of networked members;

The TrustScore and TrustPath provide the following reputation mechanisms:

❯ TrustScore represents a form of reputation based on the past and current behavior of the member;

❯ TrustPath value represents the trustworthiness of current and future relationships.

The TrustScore and the TrustPath can be displayed on the TrustUnion Member profile, as shown in *Figure 1*. Both scores can also be dis-played on a TrustUnion Affiliated Marketplace's user profile.

Members and Affiliated Marketplaces have the option to customize the level of personal data displayed on their profile.

TrustScore and the TrustPath are the two major scores provided by the TrustChain that create a quantified value representing an entity trustworthiness.

❯ TrustScore is the basic metric of Trust in the TrustUnion ecosystem. TrustScore is calculated based on past behavior on the TrustUnion network and TrustUnion Affiliated Marketplaces. TrustScore is modified depending on the quality of the transactions a member performs. This

score follows the basic principles of peer-to-peer evaluation found in most online marketplaces but is also affected by the TrustScore of direct outgoing connections. If a direct outgoing connection from a user is identified as a bad actor, the TrustScore of the user will be affected.

> TrustPath is determined by the TrustScore of all the nodes between two members and the quality of the link between each node on the path. TrustPath analyzes the trustworthiness of the "friends of friends chain" between two interacting users. This process estimates the quality of trust available in that relationship. TrustPath prevents users from manipulating the system by taking into account the chain of trust for each degree of separation between two users.

The quality of a connection is defined by age. Connections are automatically timestamped on the blockchain in order to identity manipulation within the network.

TrustChain is a peer-to-peer network mesh. *Figure 2* below presents a diagram demonstrating the operation of the TrustChain. TrustChain connects TrustUnion member nodes to each other in

Figure 2
Representation of the TrustChain
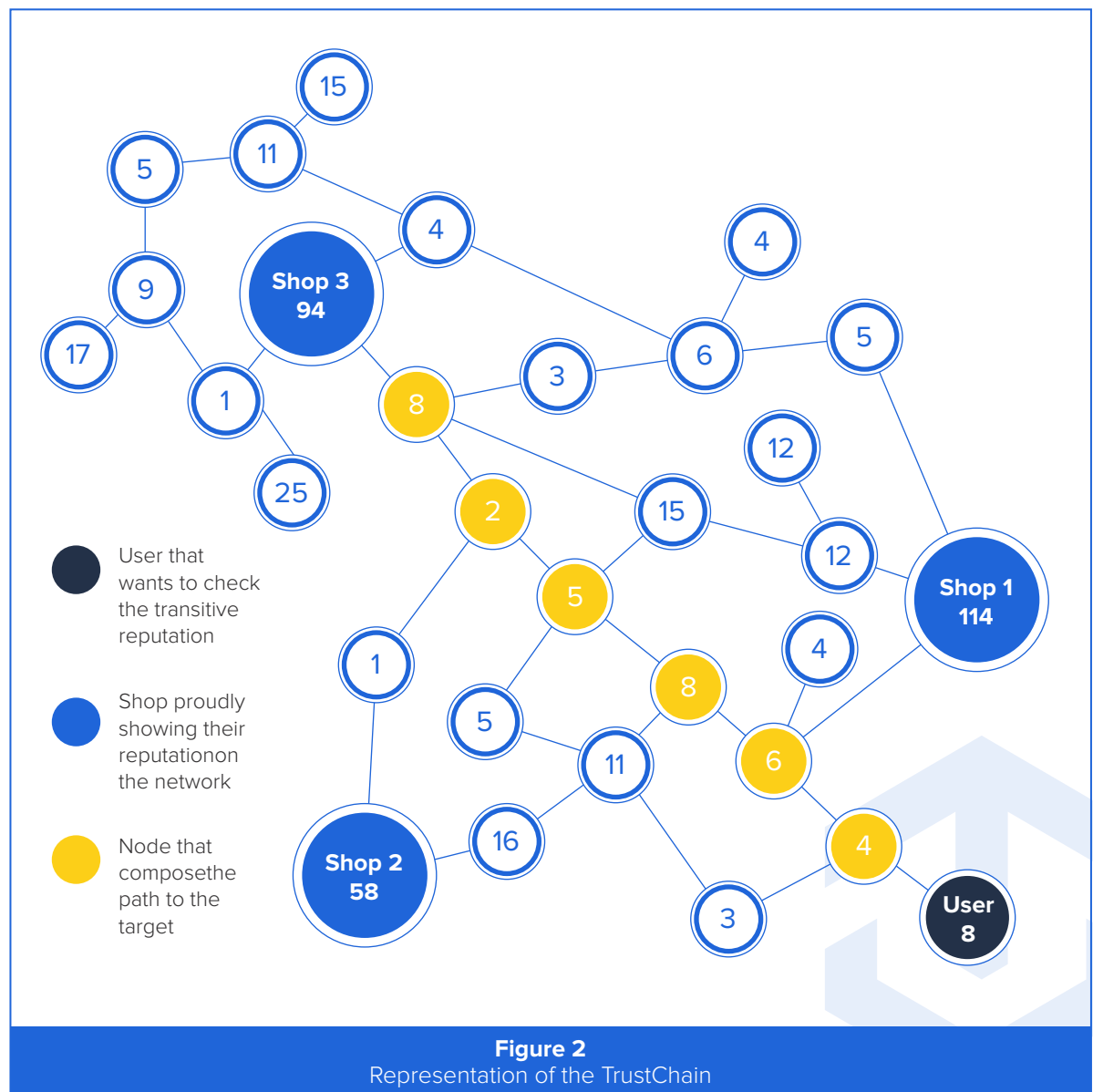
a mesh manner. Any two members can be directly connected or connected with several nodes between – the TrustPath.

The higher a member's TrustScore, the more trust the other member can have for them.

A member can also retrieve the TrustPath value with any other member dynamically. More information on the TrustPath value calculation will be explained in section XX.

2.2.3 The research behind the TrustChain

The TrustChain is based on an adaptation of the concept of "small world".

A "small-world" means a semi regular network. In their article, Watts and Strogatz state that this name was chosen as an analogy with the small world phenomenon which states that we can easily make a connection between two people anywhere on the globe within seven steps. (The famous 6 degrees of separation).

2.2.4 Trusted Relationships, Not Social Networks

TrustUnion network users are provided with a limited number of possible connections. This limit ensures careful connection curation. Users connect with others to convey their trust in a user. The TrustUnion yellow paper provides an in-depth breakdown of TrustUnion connection limitations and function.

2.2.5 TrustScore evolution

Users are scored on the behavior of linked individuals. This ensures users to curate the list of individuals they know that they genuinely trust.

The number of direct outgoing connections from a user will grow during the lifespan of an account. Total connections will remain limited, however, and are highly dependent on TrustScore.

By limiting direct outgoing trust connections and linking behavior and reputation between users, TrustChain establishes a robust organic trust model that enhances the intrinsic trust value of individual connections.

2.3 TrustUnion secure trust management system

This section describes the Trust-as-a-Service products provided by TrustUnion.

2.3.1 TrustScore

Blockchain technology presents new methods of verifying transaction validity. TrustScore leverages the immutability and transparency of Distributed Ledger Technology to assess the transaction

validity. TrustScore is an aggregated score of all past transactions performed by a TrustUnion member on the TrustUnion Network.

TrustScore is provides measurement of the trustworthiness of a TrustUnion member. This score replaces the current trust paradigm, which is easily manipulated. Fake reviews and fake ratings are commonplace within digital economies[4]. TrustScore eliminates the collusion effect.

TrustScore is a product of the TrustUnion Trust as a Service (TaaS) product suite. TrustScore enables any TrustUnion Affiliated Marketplace to implement a TrustScore on end-user profiles. TrustUnion Affiliated Marketplaces are able replace standard reputation engines with TrustScore.

TrustScore can be integrated by any service provider seeking to upgrade their Trust Management system. Providers are able to leverage TrustScore to provide user reputations that can be verified, trusted and transported across other TrustUnion Affiliated Marketplaces. TrustScore can also be integrated into dApps, mobile apps and web services.

As the development of the TrustUnion system progresses, additional TrustScore integration options will be added to the TrustUnion Trust-as-a-Service product suite.

2.3.2 Trust Path

The interlinked nature of human relationships makes it possible to assess the trustworthiness of an individual based on their peer network and the path between their peers.

2.3.3 TrustPay – The Transactions That Power Trust Services

Online payment technology has created a convenient and scalable method of performing transactions. Both small businesses and individual customers alike benefit from the convenience of mobile payments[5]. Digital currencies are a logical extension of online payment technology, but these new payment methods are limited by scalability and security issues[67]. The ubiquity of electronic payments has established a need for secure and scalable payment methods that are compatible digital economy applications.

The TrustUnion TaaS Product Suite depends on a reliable data on behavior, actions, and transaction of members. TrustUnion offers the TrustPay payment system within the TrustUnion system, which functions as a tamper-proof source of transaction information.

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4   https://nymag.com/intelligencer/2018/12/how-much-of-the-internet-is-fake.html

5   Haifeng Wu, Xuan Li, Weihui Dai, Weidong Zhao, "Mobile Payment Framework Based on 3G Network, Proceedings of the Third International Symposium on Electronic Commerce and Security Workshops(ISECS '10) Guangzhou, P. R. China, 29-31, pp. 172-175, July 2010

6   Hayes, Adam (18 October 2016). "The Three Major Bitcoin Protocols Explained". Investopedia. Retrieved 18 January 2017.

7   Croman, Kyle; Eyal, Ittay (2016). "On Scaling Decentralized Blockchains" (PDF). doi:10.1007/978-3-662-53357-4_8. Retrieved December 10, 2017.

The key payment features delivered by TrustPay are as follows:

Refund TrustPay delivers seamless refunds. The refund function is called when a payment needs to be canceled and the amount paid transferred back to the payer

Recurring payments TrustPay allows users to make recurring payments. This establishes a framework for business models within TrustUnion's Affiliated Marketplace such as monthly product orders or service subscriptions.

Deferred payment TrustPay allows users to make recurring payments. This establishes a framework for business models within TrustUnion's Affiliated Marketplace such as monthly product orders or service subscriptions.

Split payment Split payment allows users to share a payment across multiple users. Split payment provides expanded flexibility for users to pay bills. Users are also be able to manage collective finances in a trusted environment. Split payment transactions are collectively signed by participants before execution.

One-Click payment Repeatedly entering billing and shipping information is frustrating. One-click payment streamlines the checkout and payment process. Users are able to transact by using predefined personal data. Businesses benefit from rapid payment and expanded revenue.

Escrow Transaction-based environments inevitably cause disputes and conflicts. TrustPay accommodates any conflict or dispute through an Escrow system. The Trustpay Escrow system mediates and resolves any conflict between users. Escrow is an optional feature that can be activated for any transaction. Sellers are able to activate the Escrow feature for all transactions or on as-needed basis. Escrow dispute or conflict can be filed by any users even after the transactions occur.

Users are able to reject disputes and enter into mediation, or simply accept the dispute and release escrow funds. TrustUnion dispute resolution is currently under development.

2.3.4   TrustUnion Accounts and Usernames

2.3.4.1 Usernames

The TrustUnion system allows accounts to be referenced by usernames.

Usernames are used to receive money via the TrustPay payment system. Usernames can also be used to share permission-based account information.

Usernames are managed by the Identity and Access Management (IAM) module and are stored in a specialized Identity blockchain.

2.3.4.2 TrustUnion Connect

TrustUnion Connect is a single sign-in application which allows TrustUnion members to sign-up and login. Connect allows members to interact seamlessly with their TrustUnion account on other websites, mobile applications, or dApps.

2.3.5 Community Tools for TrustUnion Affiliated Marketplace

The voting system is inherited from the TrustUnion governance system. The details of the TrustUnion governance system are detailed in section xxx.

TrustUnion enables community owners to configure a voting system. These systems can be configured in with adjustable parameters. These parameters include the way voters will prove their identity to vote and will define the calculation of the weight of their vote.

The TrustUnion voting system ensures the cost of vote manipulation is prohibitive. TrustUnion Affiliated Marketplaces are able to pair directly with the TrustUnion voting system. This ensures Affiliated Marketplaces are able to develop a close relationship with their users.

2.3.6 TrustUnion Data Management Service

2.3.6.1 Data storage

TrustUnion offers easy access to private and secure storage to members. Data storage is handled by the Trust Management System. Physical storage is performed on a specialized blockchain.

2.3.6.2 Data sharing

The data sharing mechanism supported by TrustUnion's system allows members to store and share a selection of stored data with selected 3rd party.

All shared data is encrypted within the ecosystem to ensure data privacy. Attribution-based encryption (ABE) is used as a data de-duplication mechanism to ensure efficiency and security. ABE de-duplicates encrypted data and shares it with authorized users only.

2.3.6.3 Data stamping

The TrustUnion data management product allows authorized 3rd parties to stamp stored data.

The data stamping features enables services such as data notarization.

Potential use cases for data notarization include regulatory KYC requirement adherence. Identity data can be digitally notarized. This allows members to provide KYC data to businesses or services without disclosing private information. TrustUnion-enabled digital notarization increases the control members have over personal data and minimize the thread of identity theft or fraud.

2.3.7 TrustEyes

The rising presence of bots used simulate real account behaviors through fake accounts negatively impacts the digital economy. Bad actors misuse their target platforms or, worse yet, conduct sybil attacks. These bots are becoming increasingly sophisticated at convincingly mimicking human behavior. Platform owners now find it difficult to distinguish between real humans and bot accounts. This generates various problems, such as brute-force login attempts, fake accounts,

and fake reviews. TrustUnion proposes an AI behavior analysis product called TrustEyes to solve this problem. TrustEyes flags abnormal behaviors and identifies bot activity.

The TrustEyes analysis product consists of three distinct components:

> Anti bot mechanics that reduce bot creation;

> Anti spam mechanics that make repeated requests prohibitively expensive;

> AI and deep learning methods that identity bot activity behavior patterns..

TrustEyes is reinforced by TrustChain, establishing a robust and dynamic authenticity and trust identification and management ecosystem.

2.4 Benefits of the TrustUnion system

TrustUnion offers tools to the digital economy that enable existing and new forms of business to flourish thanks to an array of trust-based products.. These solutions must be able to deliver varying levels of trust, as well as a fully secured management system that prevents bias or corruption.

The TrustUnion system provides these features by delivering the following key benefits:

> **Secure** – TrustUnion architecture and services protect the system and users against sybil attacks, man-in-the-middle attacks, and collusion;

> **Fair** – The TUN token design allows anyone to participate in the TrustUnion system;

> **Decentralised** – The TUN token design empowers network participants while avoiding centralization. TrustUnion's governance mechanism delivers a fully community controlled system;

> **Privacy** – All sharing of personal data and information is performed through zero-knowledge and follows a principle of frugality;

> **Scalable to support millions of users** – The TrustUnion token economics model reinforces the creation of large distributed node networks;

> **Adapted to the new digital economy** – Validation of trust within the TrustUnion ecosystem is enabled by TrustPay. This system is designed specifically for peer-to-peer digital marketplaces and ecommerce applications.

The benefits to stakeholders within the TrustUnion system are as follows:

> **End User** – The TrustUnion secured management system, is guaranteed to identify trustworthy sellers and buyers. End users access to a faster payment system that streamlines the online payment experience.

> **Trusted Affiliated Marketplace** – Trusted Affiliated Marketplaces who implement TrustUnion secured management system products benefit from a higher conversion rate, better engagement, and enhanced customer retention.

> **Resource provider** – Network participants are rewarded for the power they contribute to the TrustUnion network. Participants are also able to vote on the evolution of TrustUnion system.

> **Governance participant** – Network participants that participate in the TrustUnion governance system are rewarded for their contributions.

> **Developers and Value Added Service Providers** – Developers that create technologies, products or services on top of TrustUnion technology grow their own businesses within the Trust Economy.

3 A COMMUNITY-OWNED SYSTEM

3.1 Governance

The purpose of governance is to facilitate practical and fair management. The TrustUnion ecosystem implements on-chain governance in which everyone can participate. This ensures every decision that is made is done so in a transparent manner. The TrustUnion governance model delivers flexibility and adaptation beyond traditional models of governance.

TrustUnion integrates a democratic model of governance. To achieve this, TrustUnion has solved two critical issues with contemporary governance models:

> The NO vote is given a voice;

> Elected ideas must have the capacity to be implemented. The viability of an idea is validated before final acceptance.

TrustUnion uses a weighted vote scheme to solve these problems. The weighted vote scheme allows voters to have multiple votes, with more for votes than against. Karel Janeček has demonstrated that having several votes with more positives than negatives is more effective in engaging voters. The cycle described below in *Figure 3* ensures elected ideas have implementation potential.

TrustUnion's system model encourages the community to participate in the project's evolution. Members can participate in a monthly vote to choose which project to finance. The community will have a major role in project proposal creation. The community will receive a fully documented proposal and can choose whether or not to participate. There are several main roles within TrustUnion governance, which include:

a. **Expert Auditor** – Audit the technical and non-technical aspects of the ecosystem

b. **Policy generator** – Create policies to maintain the efficiency of the ecosystem

c. **Masternode owner** – Masternode owners are be able to vote on proposals.

d. **Masternode share owner** – A user who co-owns a masternode is able to vote on proposals.

TrustUnion's governance model is based on the concept of decentralized self management. It establishes open, fair, scalable, and flexible governance, creating frictionless communication. The
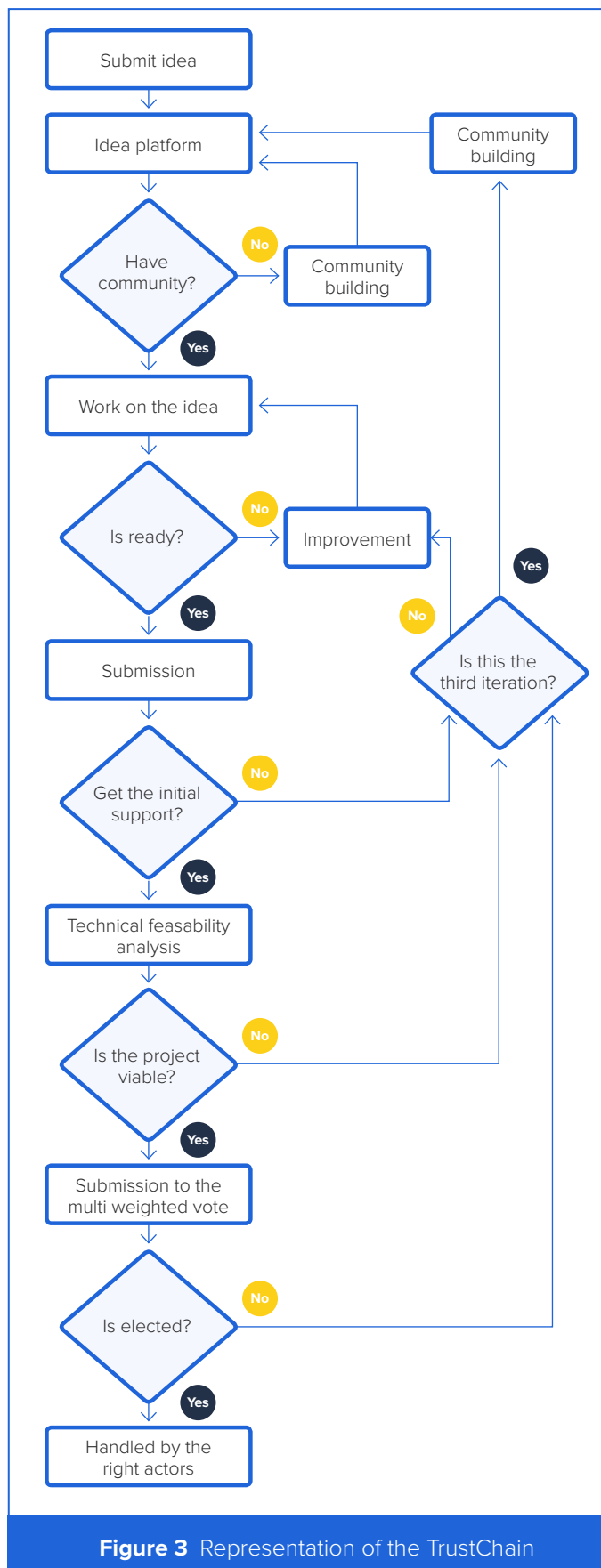
Figure 3 Representation of the TrustChain

governance model allows members to vote efficiently in real time .

Policy generators will create several basic guidelines and policies for TrustUnion system. As time elapses, users will be able to submit proposals through the mechanism described in *Figure 3*.

TrustUnion Governance consists of three main phases that are divided based on functionality:

a. **Informational** – In this phase all relevant information about the ecosystem is disclosed. This information includes but is not limited to procedure, rules, and guidelines. New ideas and proposal are introduced in this phase.

b. **Decisional** – Decision making occurs in the second phase. Masternode owners and shareowners vote on ideas and proposals to determine whether they should be implemented or not.

c. **Operational** – Successful proposals are implemented in this phase. The originator of a successful proposal will lead this phase to guide implementation.

The unique value proposition of TrustUnion Governance is the weighted vote scheme. This scheme enables fair results as not all voters have the same amount of influence over results. Weighted voting provides voters with a voice while ensuring vote equality. This voting structure integrates idea flow implementation as outlined in *Figure 3*.

There are four main phases in the proposal implementation flow:

Personal phase: Brainstorming
The initial phase in which the idea owner/proposer submits their first draft proposal.

Community phase: Aggregation
The proposal owner defines the rules and invite other users to provide feedback to their proposal. This creates a community in which members interact and discuss the idea together. In this phase the proposal evolves based on feedback aggregation to achieve a common goal within the community.

Commitment phase
Once the proposal owner has aggregated and implemented enough feedback, proposal is submitted. The preliminary proposal submission requires a certain number of votes to continue. This step filters low-quality proposal or proposals not aligned with the community's goals or interests.

Preliminary operational inspection phase
In this phase expert auditors examine the operational feasibility of the proposal. Auditors evaluate a proposal based on impact, security, risk. Auditors then create a final report assessing the validity of a proposal. If the proposal is invalid, it is moved back to the aggregation phase where another discussion occurs to improve it. If the proposal is feasible it is pushed to the voting phase.

Voting phase
Masternode owners and shareowners vote on the proposal in this phase. Votes are multi-weighted and present multiple possibilities for polling.

This mechanism provides means of generating policy by leveraging community engagement and interaction. The proposal mechanism establishes an ecosystem that filters low quality or inconsistent ideas.

The proposal implementation flow is the evolution of democratic governance. Participants receive feedback and capture community involvement that drives further engagement,

4 MARKET OPPORTUNITY AND GO-TO-MARKET

4.1 About the Trust Economy

The core foundation of commerce is trust. Without a secure and accurate method of assessing the trustworthiness of participants in any economic system, a variety of factors such as buyer and seller reliability and counterparty risk issues make safe, reliable trade virtually impossible.

4.1.1 The evolution of trust: from belief to action

In the early years of the USA, banks established themselves as reliable, trustworthy financial institutions by establishing impressive, structurally sound buildings in developing towns to foster trust. The architectural solidity of these institutions not only signaled a bank's access to capital but also represents a long-term investment in the local community for future generations.

The second Industrial Revolution saw production drift further from the point of consumption. The uniformity of factory-produced items, such as the Model T Ford, established a baseline of quality assurance that encouraged consumers to believe Ford-branded vehicles were reliable and consistent wherever they were purchased. The rise of the brand economy saw consumers begin to inherently trust brands.

In the modern world, however, brand trust is rapidly evaporating. The fourth industrial revolution, characterized by the disintegration of borders between the digital and physical world and spear-headed by blockchain technology, has had a profound impact on the way trust is generated, assessed and leveraged in economic systems.

Consumers are now obligated to trust how organizations use algorithms to best deliver services that are intimately tied to their individual data and personal preferences. Trust, as a result, is no longer directly impacted by a consumer's perception of a brand, instead, trust is increasingly rooted in action. The value and trust consumers associate with a brand is now inherently linked to how its values come to life through observable behaviors and societal impact.

4.1.2 The Importance of Trust in the Digital Economy

Trust is a highly valuable currency in the world of commerce. Transparency is a key factor in how consumers interact with and trust brands – the Salesforce Trends in Consumer Trust Research Study demonstrates that 91 percent of consumers are more likely to trust a company with their data if the company is transparent about the way in which it is used. Furthermore, 79 percent of consumers are willing to share relevant personal information about themselves with companies in exchange for contextualized interactions, such as personalized offers before purchases.

The digital economy has grown rapidly since its inception in the late 1990s. A 2018 report by the International Monetary Fund[8] indicated that the digital economy is now worth over $3 trillion USD. The distant nature of the digital economy – in which consumers are able to purchase goods and services from providers anywhere on the planet – has made trust a critical and quantifiable element of the global economy.

4.1.3 The rise of the peer-to-peer economy

The digital economy, however, is evolving. Consumers no longer purchase goods and services in a vertical manner, relying instead on centralized service providers, manufacturers, distributors, and supply chains. Instead, consumers are participating in a new economic system that allows for the on-demand, peer-to-peer supply of goods and services – the sharing economy. Characterized by collaborative consumption, the sharing economy is growing rapidly. International supply chain giant DHL anticipates that the sharing economy will be valued at over $320 billion USD by 2025.

The core of the sharing economy is trust. While platforms such as Airbnb and Uber have functioned as the vanguard of the collaborative economic revolution, the centralized manner in which they operate forces consumers to rely on third-party arbitrage. The next evolution of the digital economy, however, allows for the creation of a truly decentralized trust paradigm through a new immutable, transparent tool – blockchain technology. The fourth industrial revolution, driven by blockchain technology, is underpinned by a new economy: the Trust Economy.

Trust Economy Summary:

a.   The digital economy is dependent on data sharing, transparency and security;

b.   The sharing economy is driven by the frictionless interaction between suppliers and users on an open platform;

c.   The Trust Economy transforms digital interaction between peers and funneled by AI into trust;

4.1.4 Enabling the Trust Economy to foster trust

The TrustUnion Trust-as-a-Service product suite fosters the integration of true trust components into digital platforms. This supports the development of the Trust Economy.

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8   https://www.imf.org/~/media/Files/Publications/PP/2018/022818MeasuringDigitalEconomy.ashx

This integration is already occuring. Services such as identity pre-approval and potential customer profiles require authentication and approval. This represents a use case of TrustUnion TaaS. In a world where consumers possess TrustScore and a TrustPath, services can easily base the approval of new customers on TrustUnion data. These services will eliminate a significant amount of adoption friction. TrustUnion's members represent a significant market opportunity for customer acquisition.

Examples of existing services that would benefit from TrustUnion TaaS include::

Tala – A credit system aimed at providing the unbanked and underbanked with an alternative data system that delivers access to credit – even without a banking history.

Trustbond – A new trust economy enterprise that replaces traditional lease cash bonds with surety certificates issued by the platform, available for a percentage fee on the bonds amount.

New type of services will become available as the Trust Economy evolves. Future Trust Economy participants can securely store their identity with TrustUnion. Users can define the conditions in which their identity can be shared. Any service affiliated with TrustUnion can request member identity data using Zero Knowledge proofs. this allows services to verify ID data without actually exchanging the ID itself. The functionality offered by TrustUnion will remove critical frictions on Trust Economy services.

4.2 TrustUnion go-to-market

TrustUnion's vision will be achieved via a go-to market that takes multiple factors into consideration.

The TrustUnion go-to market will be executed in three phases.

4.2.1 Stage 1 – Demonstrating intent

The first stage of development is functional mockup. This mockup will demonstrate search functionality for consumers who want to know more about the reputation of any particular merchant. TrustUnion will aggregate merchant reputation from specific vertical slice taken from various marketplaces.

Consumers will be able to check the reputation of a merchant and assess if their reputation. This allows consumers to assess the consistency and accuracy of merchants across multiple marketplaces. Stage 1 provides consumers with a way to check if merchant reputation has been manipulated..

Merchants will be able to prove the ownership of their reputation for each marketplace TrustUnion collects data from. TrustUnion will aggregate business reputations from three e-commerce marketplaces and payment systems. Data will be collected from merchant reputation scores and complemented with social media data. Merchants will also have the option to add their own website as a source of reputation for their TrustUnion profile.

The first phase will provide a simple and effective way for consumers to learn everything they need to know about the reputation of a merchant they are considering transacting with. The key metric for this phase is defined as the number of requests performed for each search.

Users acquired through phase 1 will become a part of the beta-tester TrustUnion community. These users will help TrustUnion to understand consumer needs and adapt the implementation of TrustUnion into a concrete end-product.

4.2.2 Stage 2 – TrustUnion's complete offer – visual mockup

Visualizing the complex ecosystem that TrustUnion will become is difficult. To illustrate the TrustUnion end-product, TrustUnion will develop a complete draft of the user interface. This visual mockup will intended to provide a representation of all the available products and interactions offered within TrustUnion.

Stage 2 will share the TrustUnion vision with our community, gathering feedback that will be used to improve development. Video content will be available to help users interact with the TrustUnion product and provide community members with the ability to give the team comprehensive feedback.

4.2.3 Stage 3 – TrustUnion TrustChain Proof of Concept

Stage 3 is a Proof of Concept (PoC) constructed on a private fork of an existing blockchain protocol. This Proof of Concept will resolve the majority of technical uncertainty in the development of the TrustChain.

The development cycle will simulate the genesis of the TrustChain, modeling the creation and evolution of trusted nodes with direct outgoing and incoming connection links.

Beta TrustUnion community members in will be included the test of the PoC to gather significant measurable results.

These three phases will demonstrate that TrustUnion will penetrate the market in a coherent way. The TrustUnion go-to-market removes launch risks by addressing four key elements:

› **Demonstrating intent** – An assessment of user interest inTaaS adoption with real-world key metrics

› **Visual mockup** – A demonstration of the TrustUnion team capacity to develop an intuitively-designed product and project themselves into the finished product, taking into account future user feedback

› **Proof of Concept** – A demonstration of ability of the TrustUnion team to develop a reliable product based upon blockchain technology

› A demonstration of ability of the TrustUnion team to develop a reliable product based upon blockchain technology

5 ROADMAP

5.1 Phase 1: Tully-fisher*

Q4 2016	Project Genesis, initial TrustUnion conception	100%
Q3 2017	Recruitment phase 1	100%
Q4 2017	Auditing the project concept in: ❯ Blockshow Asia 2017 Singapore ❯ Blockchain World Conference 2017 Bangkok, Thailand	100%
Q1 2018	Auditing the project concept in: ❯ Blockchain Cruise Asia 2018 Singapore ❯ Blockchain & Cryptocurrency Con 2018 (BCC-2018) in Texas, USA ❯ Blockchain & Bitcoin Conference Bangkok 2018, Thailand.	100%
Q2 2018	Auditing the project concept in: ❯ WeAreDevelopers World Congress 2018 Vienna, Austria ❯ Leadership – The Swiss Way Zurich 2018, Switzerland ❯ Crypto valley labs Zug, Switzerland	100%

5.2 Phase 2: Hydra

Q2 2018	Signing of a mandate with the Langlois Group in Canada	100%
Q2 2018	Signing European Charter of Safe Regulation with Icocharter.eu	100%
Q2 2018	Signing Strategic Cooperation with Chaineum.com	100%

Q2 2018	Foundation of the company – SmartPulsar Technology Inc in Canada	100%
Q3 2018	Signing Strategic Cooperation with Propulsive.io	100%
Q3 2018	Signing Strategic Cooperation with Nicolas Gauvrit, mathematician in Cognitive Science	

5.3 Phase 3: Centaurus

Q4 2018	Publication of our first Light Pager	100%
Q4 2018	TrustUnion won the startups competition organized by Blockshow Asia	100%

5.4 Phase 4: Virgo   **WE ARE HERE**

Q1 2019	First publication of the TrustUnion White Paper, Mathematical Paper, Technical specifications, Business plan, Financial plan and Marketing plan, exclusively for private and venture investors and partners.
Q1 2019	Foundation of the company SmartPulsar Technology Ltd in Singapore
Q1 2019	Opening Round 1 to enter the capital of SmartPulsar Technology
Q2 2019	Demonstrating intent – functional product. Capture information on the trust needs of consumers and businesses . ❯ Architecture design of the functional model ❯ Development of the functional model ❯ Security and quality checking ❯ Beta release for the public ❯ Patch and Correction from the feedback of the beta-tester ❯ Release of the functional model.
Q3 2019	Opening Round 2 to enter the capital of SmartPulsar Technology
Q3 2019	Visual mockup – intuitive designer product Reveal insight into the final product and the possibilities it offers. ❯ Ergonomics and final vision design ❯ Public video demonstration, and real case immersion.
Q3 2019	Recruitment phase 2
	Back-end developers, front-end developers, QA engineers, project manager
Q3 2019	Opening Round 3 to enter the capital of SmartPulsar Technology
Q3 2019	Proof of concept on a blockchain environment of the TrustChain technology. Strategic cooperation and investment of a fund related to the protocol used for the MVP (currently confidential) Review project technology and demonstrate the strength of TrustChain

Q4 2019	Public release of the TrustUnion White Paper, technical specifications, and mathematical paper
Q4 2019	Accreditations action
Q4 2019	Marketing phase 2
Q4 2019	Opening Round 4 to enter the capital of SmartPulsar Technology

5.5 Phase 5: Great attractor

Q1 2020	Marketing phase 3
Q1 2020	Strategic partnership plan announcement

5.6 Phase 6: Laniakea

Q2 2020	Recruitment phase 3
Q2 2020	Production Production phase 1 : Phase G1 　　Wallet – Transactions – Consensus Production Phase 2: Phase G2 　　Instant send – Masternodes – Delegated gouvernance Production Phase 4 : Interphase 　　Data sharing – storage – interblockchain connection Production Phase 5 : Prophase 　　Oracle – verification – username Production Phase 5 : Métaphase 　　Shared payment – recurring payment – deferred payment – refund Production Phase 6 : Anaphase 　　Feedback behavior analysis – Authentication interconnection Production Phase 7 : Télophase 　　Transitive trust – Escrow
Q4 2020	Global Protocol support, v1.0 on Testnet ❯ Global Architecture improvement ❯ QA of the version featured ❯ Global beta release in testnet environment ❯ Patch and Correction from the feedback of the beta
Q4 2020	Network with TrustUnion Protocol, v1.0 on Mainnet ❯ QA of the new version featured ❯ Beta release in mainnet environment ❯ Patch and Correction from the feedback of the beta

5.7 Phase 7: Shapley

Q1 2021	Beta test TrustUnion protocol V2 with Strategic partnership on Testnet
Q2 2021	Beta test TrustUnion protocol V2 with Strategic partnership on Mainnet
Q3/Q4 2021	TrustUnion Protocol is functional

5.8 Phase 8: Hercules – corona borealis

Q4 2022	Fully decentralized services and governance

*Note on the phase naming:

Like Astronomy, the rapidly-evolving blockchain industry is complex and obtuse. The limitless potential of blockchain technology mirrors the endless possibility of astronomical discovery. TrustUnion draws inspiration from a field of unbounded insight when naming developmental phases.

6   DISCLAIMER

This white paper written by TrustUnion is aimed to introduce TrustUnion to potential holders and investors. The following information is not exhaustive and should not be construed as any element of the contractual relationship. This white paper only serves to provide potential investors with relevant information. TrustUnion investors are invited to conduct a detailed analysis of the company and understand the current or potential value. Any information in this white paper is intended as an advertisement or investment, and in any case involves a commercial offer or in any jurisdiction to purchase goods or securities. This document is not based on any law of jurisdiction that protects the rights and interests of investors. This document is not subjected to any laws and regulations. The statements, evaluations, and financial information contained in this whitepaper are predictable statements and information. Such predictions or information include known and unknown risks that can cause actual conditions or results to be inconsistent with the estimates or results speculated in such prediction statements. Such predictable statements or information should not be considered as a commitment or obligation. Subsequent events as reflected in this white paper should not be considered a promise of profit and/or a guaranteed TrustUnion growth forecast. All calculations are based entirely on basic mathematical laws, including but not limited to Metcalfe's Law, Reed's law and Moore's law. The English version of the white paper serves as the main source of relevant information for TrustUnion metaproject. The information contained herein is sometimes translated into other languages or used in written or verbal communication with existing or potential customers, partners or third parties. Some information will be lost, damaged or distorted during the translation or communication process. The accuracy of this communication cannot be guaranteed. If such translations and information are inconsistent with the English white paper data, the English version of the White Book shall be the referred version.

7 CONTACT INFORMATION

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