Tru Reputation Protocol

Establishing Persistent Reputation via the Ethereum Blockchain

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Abstract

This document describes the **Tru Reputation Protocol**, a blockchain protocol that revolutionizes Reputation & Ratings in digital interactions. Our goal is to create a next-generation solution to the problem of trust and reputation that will solve some of the longest standing and most costly problems in digital ecosystems whilst also providing an on-ramp from off-blockchain users to blockchain platforms.

The Tru Reputation Protocol provides a unique and revolutionary solution to Reputation by moving away from Ratings & Reviews towards the selection of easy-to-understand words and phrases when describing an interaction. Moreover, the Tru Reputation Protocol provides the first digital solution to persisting Reputation between platforms and reward contributors for their feedback creating the first Proof of Reputation network.

The Problem of Reputation in Trust

Forming new relationships for business has been an issue since the dawn of commerce- how do you trust someone with whom you have never had any dealings with before? This question has led to many attempted solutions, but none have answered the problem.

In the 'real world,' personal recommendation became the de facto means of establishing a trusted reputation. As more people recommended you, your network of trust increased along with your capability to influence or transact with others.

But word-of-mouth reputation really only scales to your first-person contacts and as commerce grew it could not scale, so other complimentary systems were tried to mitigate this problem. In finance, double-entry accounting was introduced to verify information provided[1]. In the not too distant past, the primary gatekeeper for most consumers access to credit was their relationship with their bank manager- and that manager's opinion of the customer was considered essential[2].

In more recent history further attempts have been made to codify reputation to tangible benefits in commerce. By proving to be a reliable customer, you receive benefit- whether that is through a higher credit rating, receiving discounts for membership points in a customer loyalty program or receiving a partner discount as a company that has transacted enough with another to be part of their partnership program

But all of these pre-digital systems are fallible, open to corruption, subversion, and bias. Reviews can be bought; double-entry accounts can be doctored; people can be co-opted into enhancing someone's word-of-mouth character- every system has been proven to be fallible beyond the point of first-person experience and trust - every methodology that attempted to resolve this before the digital age has proven vulnerable.

With the advent of digital systems, such first-person recommendations are harder to come by given the capability to no longer just transact within your network of trust. Rather than solve the problem, digital ecosystems have compounded the issue. With each cycle of innovation in technology, this issue is becoming more systemic, not less.

The Web 2.0 has provided solutions that require single-party feedback to centralized platforms that in turn are open to manipulation by fake comments and fake reviews[3], leading to large volumes of information that is biased, useless and only increase confusion. Furthermore, such solutions work on providing ratings on a subjective, arbitrary scale that while easier to aggregate as an average it decreases the value of the feedback in establishing a reputation. Moreover, the nature of these systems means that users are generating value but ultimately are not benefiting from content that others find value in, leading to lower participation and poorer quality.

To further exacerbate the problem, ***there is no single source of truth for reputation***. Each platform has its bespoke Feedback and Reputation system, and use different algorithms and feedback mechanisms to collate that information. This inherent flaw has persisted into Web 3.0 platforms which have Feedback and Reputation systems that are only applicable to their platform. This inheritance has left them with the same systemic failings that, at worst, undermine the core value of Blockchain technologies; while they have absolute truth of transaction history via Blockchain technologies they lack a correlating non-repudiation mechanism for reputation[4].

Finally, there remains no solution that provides enough incentive for reputational persistence across platforms that any system of review or feedback can be considered authoritative. This weakness significantly increases risk in digital transactions that legal frameworks cannot move fast enough or far enough to resolve.

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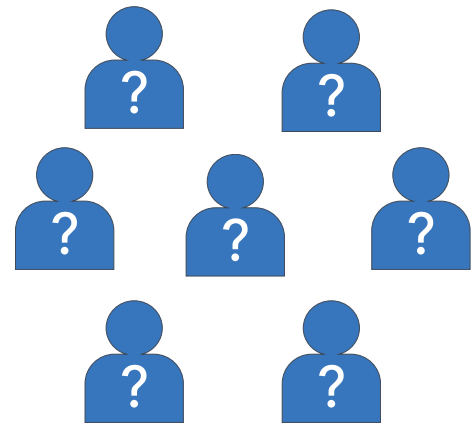
[1] 'Reputation + Transactional Proof = Trust'
[2] 'Reputation + Past Performance = Trust'
[3] **Forbes.com:** 'Amazon Sues 1,114 Fake Reviewers on Fiverr' - https://goo.gl/i7Dxky
[4] 'Transaction Proof – Reputation != Trust'

Tru Reputation Protocol: Solving the Problem of Reputation

What is the Tru Reputation Protocol?

The **Tru Reputation Protocol** provides a solution to the problem of establishing a single source of truth for Reputation in digital ecosystems By leveraging a patent-pending **Tru Feedback Algorithm**[5], the *Tru Reputation Protocol* acts as the first **Proof Of Reputation** mechanism that is natural and easy to use: each party in a transaction leaves feedback for each other by selecting or providing **Semantic Terms**[6].
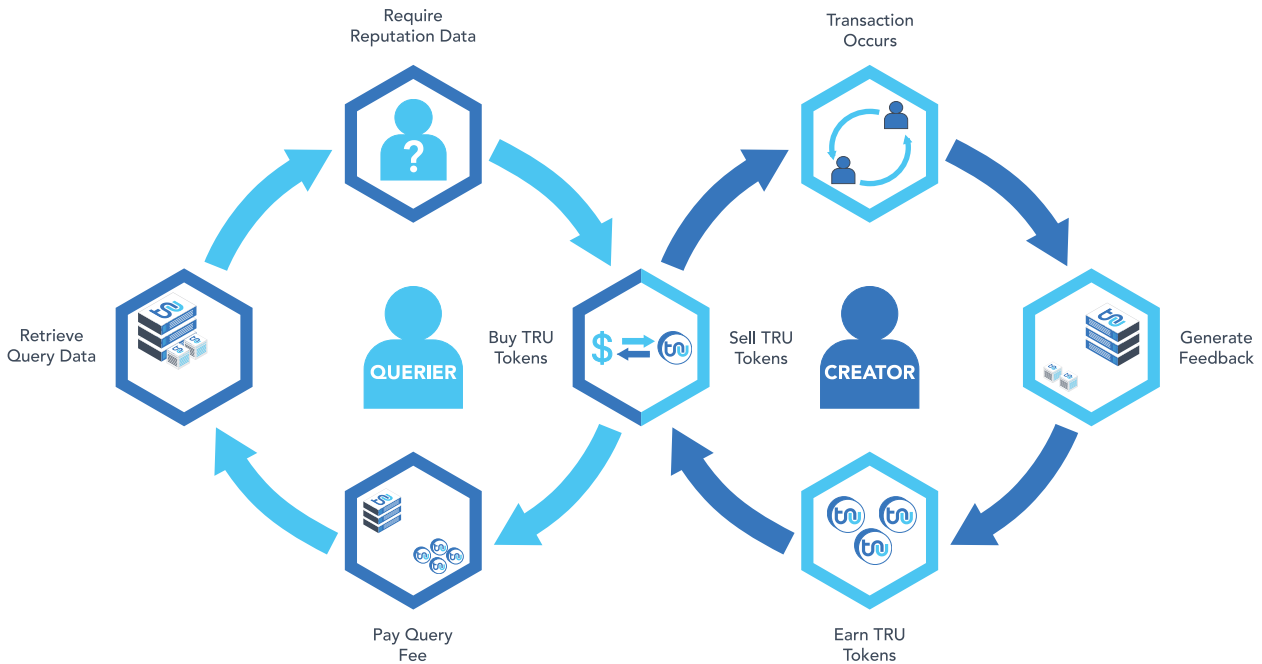
The *Tru Reputation Protocol* allows the establishing and persistence of reputation across digital ecosystems- from Web 2.0 platforms to Web3 distributed platforms- by interlinking transactions to the participants and enabling feedback on those transactions. Moreover, the *Tru Reputation Protocol* establishes an economic model around Reputation *by rewarding contributions and charging for consumption* ensuring all parties involved in the transaction are incentivised for providing feedback whilst ensuring value is derived from those who consume the reputation data from the ***Tru Reputation Network***.

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[5] **Patent**: 'A System for Facilitating the Provision of Feedback', Ian Alistair Bray - PCT/GB2016/054063
[6] **Semantic Terms**: a descriptive word or short phrase such as 'Professional' or 'Value for Money'. Can be in any written language.

Tru Reputation Protocol Use Cases

Monetizing Your Feedback & Reputation
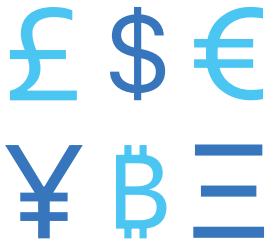
At present, whenever you leave feedback on any digital platform (e.g., Yelp, Google, E-Bay, TripAdvisor, Seamless), you do not derive any value from your effort or content- the platform hosting the feedback does, despite that content driving billions of dollars in revenue every year.

The *Tru Reputation Protocol* addresses this problem by commoditizing and valuing feedback and reputation. If you leave feedback, you accrue value for your content by being awarded *Tru Reputation Tokens*. This tradeable asset is required by any person or entity wishing to query the *Tru Reputation Network* thus ensuring a fair market price for *Tru Reputation Tokens* through supply & demand economics. **For the first time, reputation has a market value that can be quantified and exchanged**.

Persisting Reputation Between Platforms

Currently, there is no solution for persisting a reputation from one digital platform to another. Your E-Bay feedback & ratings do not transfer to Amazon, your trading feedback on LocalBitcoins does not persist into OpenBaazar.

The *Tru Reputation Protocol* addresses this weakness using the *Tru Reputation Profile* to act as a collective reference point for all the accounts you want to persist Reputation between, allowing the persistence of your accumulated Reputation from one platform to another- from the Web 2.0 to Web3 and back. Because a *Tru Reputation Profile* only includes the accounts you want it to include you can maintain the level of privacy you wish while also **leveraging your reputation in new forums**.
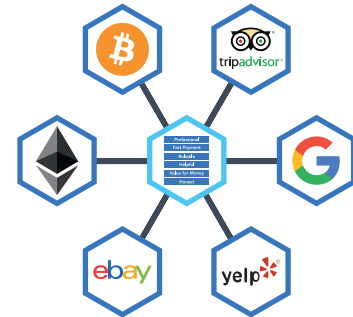
Scoring Transaction Risk Based on Reputation

Risk Score: 1.2
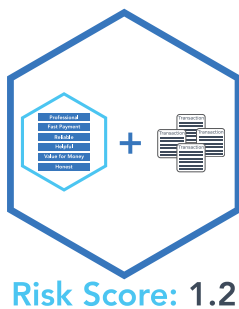
At present, most platforms that have a Reputational system do so by using either a flat scoring system[7], a rolling scoring system[8], a Standard Score applied to a rolling scoring system[9], or purely through a number of interactions on that platform. They in turn either use these reputational mechanics to provide additional benefits, whether that is discounts on trades on exchanges, high prominence in searches for online marketplaces, or purely for kudos within the community. However, these scores are arbitrary and platform specific and have no meaning outside of the platform they are on.

The *Tru Reputation Protocol* addresses these inherent flaws while also providing further scope for de-risking user interactions. By applying a scoring model to the *Tru Reputation Protocol Schema*, **a Platform can use statistical modelling to desirable behaviours on their platform**.

Furthermore, by applying weight to the number and size of the transactions on a particular platform, they can **provide a score that is tailored to the Platform that represents a complete risk/reward system within a Standard Score model**. This methodology allows for flexibility of how the Platform leverages Reputational data to provide specific perks- such as lower fees- while also ensuring Reputation persists across all platforms the user uses their *Tru Reputation Profile*.

[7] **Example:** A rating system based on a scale of 1 to 5 stars.
[8] **Example:** The sum total of all 1 to 5 star ratings
[9] **Example:** The sum total of all 1 to 5 star ratings for a user adjusted using a Standard Score statistical model to normalize the score

Enhancing Digital Security in the Internet of Things (IoT)

It is not only in human interactions that Reputation is important, it is equally necessary within digital systems and that need is becoming more urgent in the era of the Internet of Things (IoT). At present, there is no accepted protocol or standard for device based Reputation that allows devices to feedback on interactions between each other. If a device is unreliable (e.g. packet loss), is the source of an attack (e.g. DDOS zombie) or is the fastest routing point (e.g. mesh networking) there remains no method to persistent these reputational traits to allow other devices to easily assess these before interacting, and potentially changing their security posture or route of interaction. In essence, devices are left with a level of implicit trust or distrust in other devices and they do not learn for their past interactions.
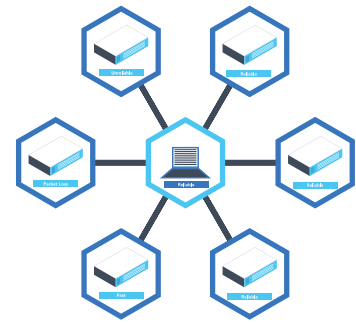
The *Tru Reputation Protocol* provides a means to address this collective digital amnesia by allowing devices to provide feedback on their interactions and for that feedback to be collated in a rapidly assessable format. **By applying the *Tru Reputation Feedback Algorithm* devices can start to interact based on informed trust**, allowing bad actors to be eliminated, points of failure to be identified, and the wider network to get smarter with each transaction. The nature of the Tru Reputation Profile allows related devices to be linked to other devices and to entities such as people or organisations.

Tru Reputation Protocol Financial Model

The *Tru Reputation Protocol* is based on a simple yet robust premise- **those consuming Reputation Data should pay those who create that Reputation Data for their effort**. The *Tru Reputation Protocol* achieves this through *Tru Reputation Tokens* that create the *Tru Reputation Network*.

The objective of rewarding those who provide *Reputation Data* by those seeking to consume it is calculated by **Equilibrium Pricing**[10]- the more demand for *Reputation Data*, the higher the award of *Tru Reputation Tokens* for creating *Reputation Data*; inversely, the more *Reputation Data* created, the lower the cost in *Tru Reputation Tokens* for demand.
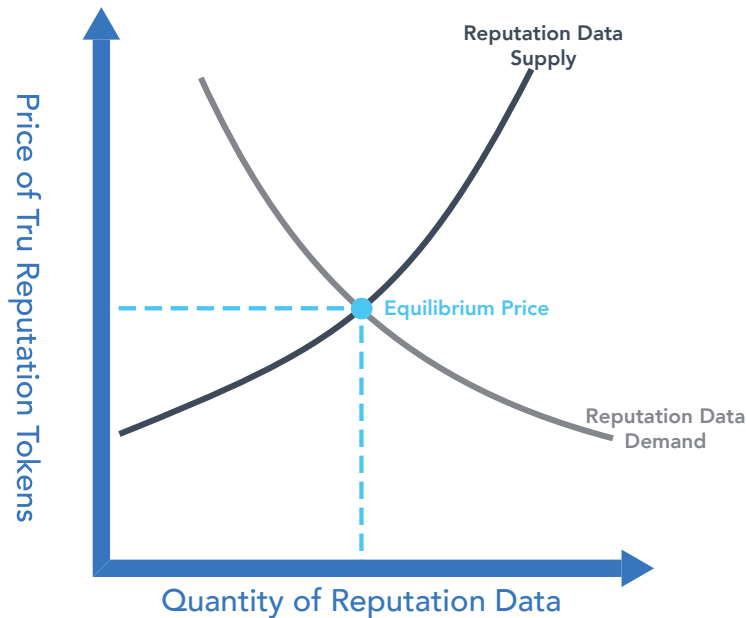
The Tru Reputation Network applies a **Tru Network Transaction Fee[11]** to all queries and Reputation Data creation activities. This fee is made up of the cost of the query in Ethereum Gas + 100%. This additional fee is then split evenly between the *Tru Reputation Network* to cover costs of running and holders of *Tru Reputation Tokens*.

Transaction Fee Breakdown
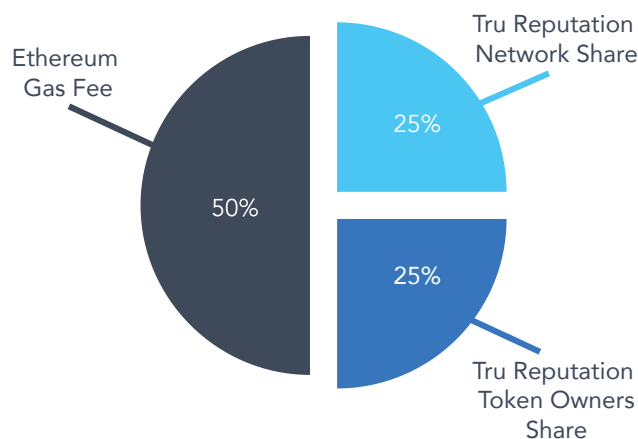
When the *Tru Reputation Network* is queried, the price of the query in *Tru Reputation Tokens* is calculated dynamically by the *Tru Reputation Oracle Service*. **This price is derived from the Equilibrium Price plus the**

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[10] **Equilibrium Pricing:** https://en.wikipedia.org/wiki/Economic_equilibrium
[11] Cost of Transaction in Ethereum Gas + 100%

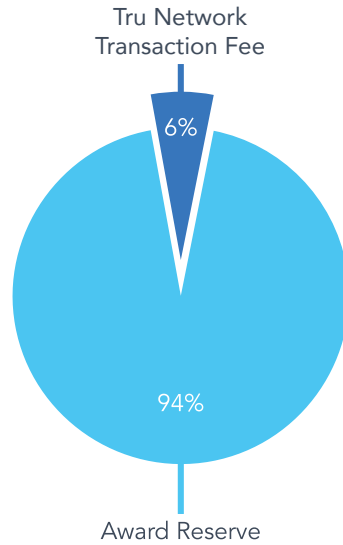*Tru Network Transaction Fee*. The remainder of the cost is placed in the Award Reserve for dispersal to *Reputation Data Creation Awards*.

Example
Tru Reputation Query Breakdown

Tru Network
Transaction Fee

6%

94%

Award Reserve

When *Reputation Data* is created, an Award is calculated by the **Tru Reputation Oracle Service based on the Equilibrium Price minus the Tru Network Transaction Fee**. The Award is split evenly between each party involved in the transaction receiving Reputational feedback along with the Platform hosting the transaction. The *Tru Network Transaction Fee* is distributed as with the Query Price- 50% to cover the Ethereum Gas cost, 25% to the *Tru Reputation Network* to pay network costs and 25% to holders of *Tru Reputation Tokens.*

Tru Reputation Example Award

Tru Network
Transaction Fee

Platform
Award Share

Party #1
Award Share

6%

31.33...%

31.33...%

31.33...%

Party #2
Award Share
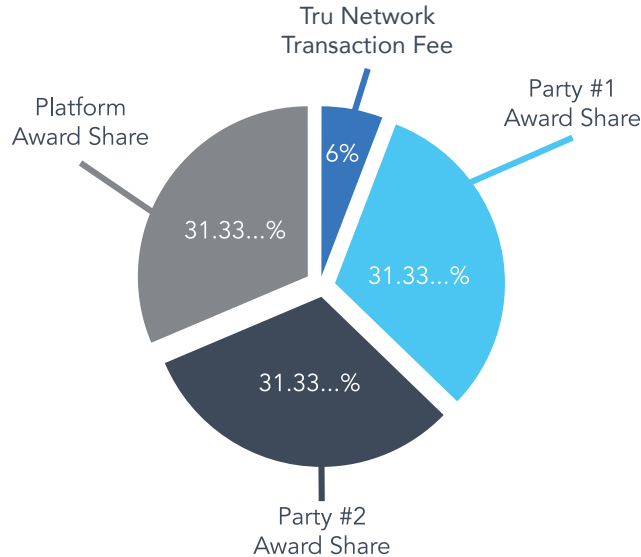
By enacting this model, **25% of every Tru Network Transaction Fee is distributed to the holders Tru Reputation Tokens** providing long-term stability to the *Tru Reputation Network*, rewarding contributors to the *Tru Reputation Network*, and continuous reward to owners of *Tru Reputation Tokens*.

Advantages of the Tru Reputation Protocol

The *Tru Reputation Protocol* represents a generational step in how Reputation operates in a digital environment. Rather than being based on 30-year-old paradigms that have been proven time and again to be unreliable and prone to fraud, the *Tru Reputation Protocol* establishes for the first time **a sole source of truth for digital reputation**. The Tru Reputation Protocol will become the de facto solution for Reputation for the following reasons:

- Only Reputation & Rating platform to offer persistence and platform agnosticism.
- Only Reputation & Rating solution to reward contributions with an innovative economic model.
- Innovative and proven[12] patent-pending Reputation technology
- Only Reputation solution to be built with the Distributed Web at its heart- the solution for the next generation of disruptive apps.
- Massively scalable network that leverages the cutting edge in distributed apps, the blockchain and off-blockchain technologies.

Why the Tru Reputation Network

We fervently believe that over the course of the coming years that the Tru Reputation Network will become integral to establishing trust in people, business and entities in digital contexts and furthermore will change how people value and create value from their feedback.

With the growth of Web3 technologies enabling the vision of a distributed web, the fundamental problem of crossing the chasm between Web 2.0 and Web3 will be decided by how the mainstream consumer market can be shown the utility and value of Web3 technologies and the promise they hold. A key concern for mainstream consumers in both the Web 2.0 and Web3 is a fundamental lack of trust in reputations, reviews and content. By creating a network that is non-repudiable, easy to consume, and crosses generational and cultural divides through its inherent flexibility we believe that the Tru Reputation Network will become a vital part of the bridging that chasm.

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[12] In use by Trubador, Inc for Trubador - https://trubador.com

Tru Ltd

About Tru Ltd

Founded in June 2015, Tru Ltd[13] focuses on delivering solutions to some of the most intractable problems affecting the current generation of Web 2.0 platforms and developing their successors for the Web3. Tru Ltd has successfully researched and developed unique algorithms and technologies that are powering the next generation platforms that will bring the Web3 to the mainstream consumer & enterprise markets.

Founders

Ian Bray, Managing Director/Development Lead

Ian Bray is a seasoned professional with over 15 years' experience in operating, managing, designing and developing some of the most complex and secure IT environments in the world. Ian has navigated the path between technical and commercial aspects of the industry throughout his career- successfully transitioning from a technical expert to executive leadership.

Ian has been an active participant in the cryptocurrency community since 2011.

https://www.linkedin.com/in/ianabray/

Dr Patrick Stewart Bray, Ph.D., Chairman

Dr Patrick Stewart Bray is a veteran, successful serial entrepreneur and executive with 45 years' experience in business- from start-ups to large multinational enterprises. Graduating with an Honours Degree in Chemistry from the University of London in 1968, and following this up with a PhD in Chemistry from the University of London in 1972, Dr Bray has worked across numerous industries during his long career.

He successfully transitioned from the Chemical industry in 1978 to the newly emerging Information Technology market, was a Managing Director UMP before becoming a member of the board of ICI ImageData with responsibility for Marketing in 1988, as well as founding a successful IT distributor which he sold in 2003.

Dr Bray is also a published author, writing the book 'Total Innovation'[14] in 1995- a book articulating the path to successfully innovating and identifying new Products with strong commercial potential and eliminating less promising ideas early. The Financial Times commissioned and published 'Total Innovation.'

Caroline Draper, Marketing Director

Caroline Draper graduated with an Honours degree in Fashion and Business Studies. She has spent the last 15 years working as a Buyer for one of the largest UK fashion retailers. In that time, she was responsible for driving product strategy from development through to delivery; including design, marketing and maintaining Brand integrity.

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[13] Tru Ltd, 20 Grove Road, Lee-On-Solent, Hampshire, PO13 9JA, United Kingdom, is registered in England and Wales, No. 09659526.

[14] 'Total Innovation: How to Develop Products That Your Customers Want', ISBN-13: 978-0273612612

Advisors

Matt Murphy

Matthew is a recognized expert in designing, building and operating technology platforms to the highest regulatory compliance. Graduating with a first-class honours degree in Computer Science from Edge Hill University in 2002, Matthew has charted a career that has encompassed both the largest enterprises as well as the most innovative technology startups.

Matthew currently serves as Vice President, Global Technology for a Global Top 3 Financial Institution.

https://www.linkedin.com/in/mattmurphy79/

Darron Antill

Darron has extensive experience in leading and growing IT companies that specialise in security software, analytics software and services. As a veteran of IT industry with a successful career in growing and establishing companies that specialise in Digital Security, he brings a wealth of strategic leadership experience to Tru Ltd and the Tru Reputation Network. Darron's previous roles include - Managing Director of Ultima Business Solutions; Managing Director of ViStorm (acquired by HP); and CEO of AppSense, Inc- where he guided the company to 270% revenue growth to over $100MM and during the Series A round for AppSense, Inc raised $70MM from Goldman Sachs.

Darron currently serves as Chief Executive Office of Device Authority, an innovator in IoT Security.

https://www.linkedin.com/in/darronantill/

Richard Martindale

Richard is an experienced technology focused Business Development specialist with many years' experience creating and building commercial and technical relationships with customers and partners across all verticals. Richard brings that wealth of experience in creating and developing business to business relationships to Tru Ltd and to the Tru Reputation Network.

Richard currently serves Area Service Manager for Ivanti, Inc.

https://www.linkedin.com/in/richard-martindale-18860b44/

Tru Reputation Token Sale

To create the **Tru Reputation Network**, Tru Ltd, a UK based Limited Company, will be holding a two stage Token Sale of **Tru Reputation Tokens (TRU)**. Tru Ltd will use the proceeds from these Sales to achieve the goals of the *Tru Reputation Protocol.*

Tru Reputation Token (TRU)

Tru Reputation Token (TRU) is an ERC20-Compatible Token delivered by the *Tru Reputation Smart Contract.* By minting TRU, the *Tru Reputation Network* will be created creating a commodity price for Reputation and providing the facilities for a marketplace to query and create feedback that underpins reputational data for people, companies and other entities.

The Tru Reputation Token (TRU) Token Sale

The *Tru Reputation Token (TRU) Token Sale* has the following objectives:

- Establish a commodity price for Reputation Data.
- Create an asset pool to underpin the commodity price for Reputation Data
- Fund short, medium and long-term development and adoption of the *Tru Reputation Protocol*
- Decentralize control of Reputation Data.
- Create an economic model that rewards honest feedback and shares the value of that data to those who created it.
- Price the **Token Sales** to fairly value TRU in relation to the existing Reputation & Review market to ensure the viability of *Tru Reputation Network.*
- Split the Token Sale into two distinct Sales- a **Pre-Sale** to be held in Q1 2018, and a **Crowd Sale** for the remaining Tokens to be held in Q2 2018.

In order the meet these six objectives, Tru Ltd will execute the Crowd Sale in line with the following:

Tru Reputation Token (TRU) Pre-Sale
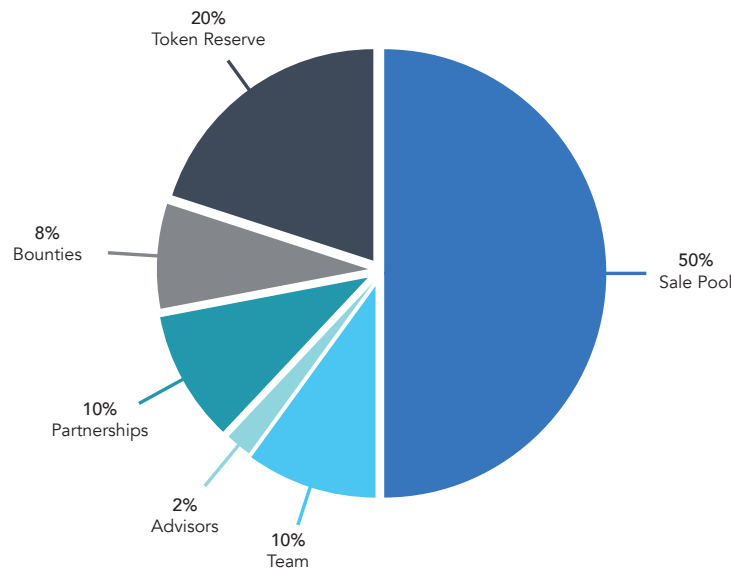A Pre-Sale for the *Tru Reputation Network* will occur from the **4th January 2018** to **5th March 2018**, for early adopters to purchase *Tru Reputation Tokens*. The proceeds of the Pre-Sale will be used to execute the Objectives of Funding Tranche 1 and upon completion of these objectives, the Crowd Sale shall be started. Up to **5,000,000 TRU** will be sold during this Pre-Sale with any unsold tokens being added to the Crowd Sale pool.

Tru Reputation Token (TRU) Crowd Sale
Upon completion of Pre-Sale, and delivery of the Tru Reputation Protocol Release 1 Deliverables, a wider Crowd Sale allowing anyone to purchase *Tru Reputation Tokens* ahead of the Production launch of the *Tru Reputation Network.* This Crowd Sale will occur at the end of Quarter 2 of 2018 (May-June 2018). The total amount of *Tru Reputation Tokens* available during the sale will be announced closer to the date but shall be no more than **50,000,000 TRU**.

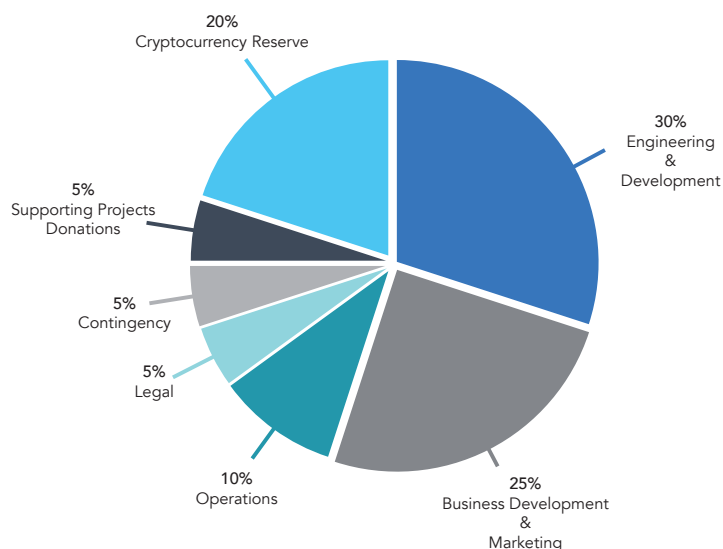### Tru Reputation Token (TRU) Token Allocation
The *Tru Reputation Token (TRU) Crowd Sales* will mint a maximum of **100MM TRU** through the Token Sales. Upon conclusion of the Crowd Sale, *TRU* will be allocated as follows and will form the static fixed amount of *TRU* within the *Tru Reputation Network*:

Sale Pool	**50%**	50% of the Token Allocation will be issued via the Sale Pool. These tokens will be allowed to be exchanged & sold 14 days following the end of the *Crowd Sale*.
Team	**10%**	10% of the Token Allocation will be held in reserve for both current and future employees of Tru Ltd. These tokens will be subject to a 3-year vesting schedule upon allocation, with a vesting of 25% every 6 months after a 12-month cliff.
Advisors	**2%**	2% of Token Allocation will be held for Advisors for the *Tru Reputation Token (TRU) Token Sale* and will vest upon successful completion of the *Crowd Sale*.
Partnerships	**10%**	10% of the Token Allocation will be held in reserve for Tru Ltd to use in establishing partnerships with other platforms to leverage the *Tru Reputation Protocol*.
Bounties	**8%**	8% of the Token Allocation will be held in reserve by Tru Ltd for awards for bug bounties in the future to ensure fair and reasonable reward for protecting the *Tru Reputation Protocol* ecosystem. Details of Bounties awards will be revealed after the Pre-Sale at https://blog.tru.ltd/.
Token Reserve	**20%**	20% of the Token Allocation will be held as a currency reserve by Tru Ltd. This reserve, acting in concert with the Cryptocurrency Reserve, will only be deployed temporarily to provide market stabilization to prevent fraudulent manipulation of the Token exchange price and provide an asset base for the Tru Reputation Network.
		Deployment of the Reserve will only occur with the consent of the Tru Ltd Advisory Board, and those decisions communicated to Token Sale participants when and if they occur.

Token Sale Use of Proceeds

Upon successful completion of the *Tru Reputation Token (TRU) Token Sale*, the funds raised will be held and released in accordance with the Token Sale De-Risking Strategy. The proceeds will be used as follows:

Engineering & Development	30%	30% of the Proceeds will be allocated for Engineering & Development of the Tru Reputation Protocol.
Business Development & Marketing	25%	25% of the Proceeds will be used for Business Development & Marketing including establishing partnerships and direct marketing.
Operations	10%	10% of the Proceeds will be used to pay for Business Operations including Finance and day-to-day operations.
Legal	5%	5% of the Proceeds will be reserved for Legal budgets- including protecting Intellectual Property and Compliance.
Contingency	5%	5% of the Proceeds will be held in contingency for use as required by the business.
		Deployment of the Contingency will only occur with the consent of the Tru Ltd Advisory Board, and those decisions communicated to Token Sale participants when and if they occur.
Supporting Projects Donations	5%	5% of the Proceeds will be held in reserve and issued to supporting projects deemed critical to the *Tru Reputation Protocol* or for projects that utilise the *Tru Reputation Protocol* in novel ways.
Cryptocurrency Reserve	20%	20% of the Token Sale proceeds will be held in reserve (split evenly between Ethereum and Bitcoin). This reserve, acting in concert with the Token Reserve, will only be deployed temporarily to provide market stabilization to prevent fraudulent manipulation of the Token exchange price and provide an asset base for the Tru Reputation Network.
		Deployment of the Reserve will only occur with the consent of the Tru Ltd Advisory Board, and those decisions communicated to Token Sale participants when and if they occur.

Token Sale Details

As previously state, the **Token Sale** for the *Tru Reputation Network* with occur in two stages:

1. **Token Pre-Sale** – up to 10% of total TRU in Sale Pool will be offered for Sale
2. **Token Crowd Sale** – Remainder of Sale Pool will be offered for Sale

The details for these Sales are as follows:

Token Pre-Sale Details

Maximum Number of TRU	5,000,000 TRU
Base Price per TRU	0.001 ETH
Pre-Sale Start Date	4th January 2018
Pre-Sale Duration	60 Days
Pre-Sale Bonus	25%
Pre-Sale Price	1 ETH: 1,250 TRU
Minimum Participation Size	1,250 TRU
Accepted Currencies	Ethereum
Funds Held By	Ethereum Multi-Signature Wallet

Token Crowd Sale Details

Maximum Number of TRU	45,000,000 TRU[15]
Base Price per TRU	0.001 ETH
Pre-Sale Start Date	End of Q2 2018
Pre-Sale Duration	30 Days
Pre-Sale Bonus	12.5%
Pre-Sale Price	1 ETH: 1,125 TRU
Minimum Participation Size	1,250 TRU
Accepted Currencies	TBA
Funds Held By	TBA

NOTE: The Number of TRU available during the **Crowd Sale** will never be more than the number listed above, but based on market conditions, and the amount of TRU sold during the **Pre-Sale** may be revised down. Please check https://blog.tru.ltd for exact details during Q2 of 2018.

Token Sale Anti-Money Laundering Requirements

To ensure compliance with international Anti-Money Laundering laws each Token Sale will be instituting a requirement for verification of identity, country of residence and contact information for all participants of the Token Sales. Further details on the specific steps required will be included in the Token Sale launch announcements, and any participants who have not completed AML checks within 30 days of the relevant Token Sale will have their funds refunded minus transaction fees for transmittal.

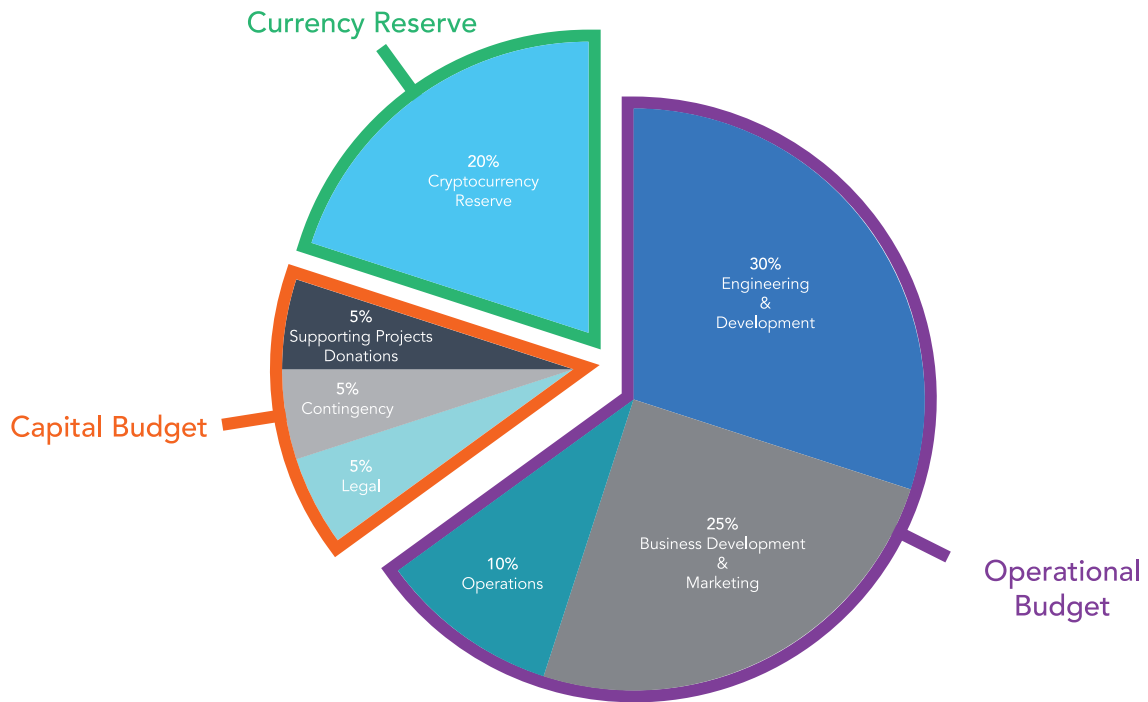## Token Sale De-Risking Strategy

Tru Ltd has noted behaviours within the nascent Token Sale/Crowd Sale market that cause concern for participants in the Token Sale, regulatory authorities and firms launch Tokens that increase the risk for all concerned. These behaviours and issues range from a lack of progress against expected developmental milestones to 'front-loading' of funding (when the capital requirements of a successful project should increase with time, not decrease), to lack of transparency of fiscal management. As such, Tru Ltd will be enacting a strategy to reduce risk to participants and increase transparency with the administration of the *Tru Reputation Network* that we hope will become commonplace for future Token Sales.

To reduce the risk to participants proceeds raised during the Token Sale will be released in accordance with set roadmap milestones that must be achieved within the set timescale, or the remainder of the funds

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[15] Total may exceed 45MM TRU if Tokens are not sold during Pre-Sale but will never exceed more than 50MM TRU.

will be returned to participants. These milestones will be assessed by the Advisory Board, with meeting minutes and results of the assessment being communicated to all participants each financial quarter. The details of this strategy are described in the following sub-sections.

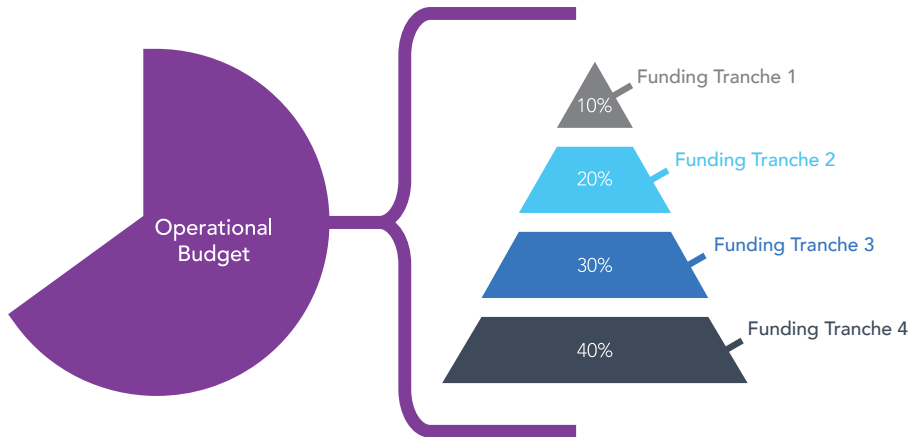Token Sale De-Risking Strategy – Budgetary Breakdown

To enact the De-Risking Strategy, the Token Sale Proceeds will be split into three budgetary pools:

Operational Budget	**65%**	The Operational Budget pool compromises all resources assigned for operational usage- namely the Engineering & Development Budget, Business Development & Marketing Budget and the Operations Budget.
Capital Budget	**15%**	The Capital Budget pool compromises all resources assigned for capital expenditure; namely the Supporting Projects Donation Budget, Contingency Budget and the Legal Budget.
Currency Reserve	**20%**	The Currency Reserve pool compromises solely of the Cryptocurrency Reserve Budget.

Of these three budgetary pools, the Operational Budget will be split into four Funding Tranches:

| Funding Tranche 1	10%	After completion of the Pre-Sale, 10% of the total Operational Budget will be made available to Tru Ltd to fund delivery of the Release 1 Milestone Requirements as per the Token Sale De-Risking Strategy - Milestones.
Funding Tranche 2	20%	20% of the total Operational Budget will be allotted to *Funding Tranche 2* which will be released to Tru Ltd according to the Token Sale De-Risking Strategy - Milestones. If made available to Tru Ltd it will be used to fund delivery of the Release 2 Milestone Requirements.
Funding Tranche 3	30%	30% of the total Operational Budget will be allotted to *Funding Tranche 3* which will be released to Tru Ltd according to the Token Sale De-Risking Strategy - Milestones. If made available to Tru Ltd it will be used to fund delivery of the Release 3 Milestone Requirements.
Funding Tranche 4	40%	40% of the total Operational Budget will be allotted to *Funding Tranche 4* which will be released to Tru Ltd according to the Token Sale De-Risking Strategy - Milestones. If made available to Tru Ltd it will be used to fund delivery of all future objectives on the roadmap.

These funding Tranches will be released in accordance with the Token Sale De-Risking Strategy - Milestones.

Token Sale De-Risking Strategy - Milestones

The following Roadmap Milestones will be set **minimum required deliverables** for the Tru Reputation Network that Tru Ltd will be required to deliver upon for release of the relevant funding Tranche against the Tru Reputation Protocol Roadmap[16].

Milestone	Deadline	Tranche	Minimum Deliverable Requirements
Initial	Pre-Sale End	Funding Tranche 1	• Successful completion of Pre-Sale
Release 1	Pre-Sale + 6 Months	Funding Tranche 2	• Beta Release of Tru Smart Contract • Beta Release of Tru Reputation Profile • Beta Release of Tru Reputation Oracle Service • Completion of Crowd Sale
Release 2	Crowd Sale + 6 Months	Funding Tranche 3	• v1.0 Release of Tru Smart Contract • v1.0 Release of Tru Reputation Profile • v1.0 Release of Tru Reputation Oracle Service • Beta Release of JavaScript Library • At Least 5 Tru Reputation Network Partners
Release 3	Crowd Sale + 12 Months	Funding Tranche 4	• v1.0 Release of JavaScript Library • v1.0 Release of iOS Library • v1.0 Release of Android Library • At Least 20 Tru Reputation Network Partners

Progress against these milestones will be assessed by the Advisory Board every quarter with the minutes of the meeting and the outcome of the assessment made available to all participants of the Token Sales. The Milestone methodology is outlined below:
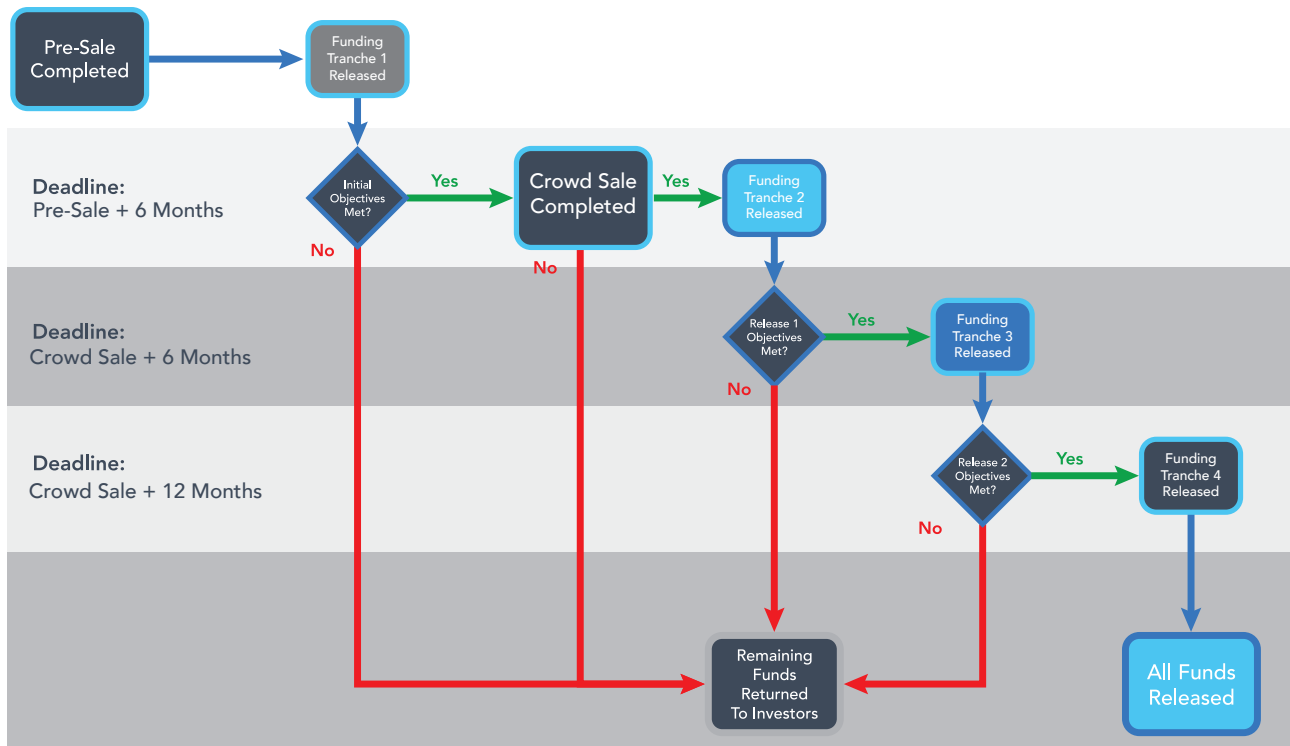
Should any of these milestones fail to be met by the required Deadline then the Token Sale De-Risking Strategy - Refund Process will be triggered.

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[16] **NOTE:** Additional Roadmap items may be added/removed from the Tru Reputation Protocol Roadmap but the Milestone Requirements will not vary and take priority.

Token Sale De-Risking Strategy – Refund Process
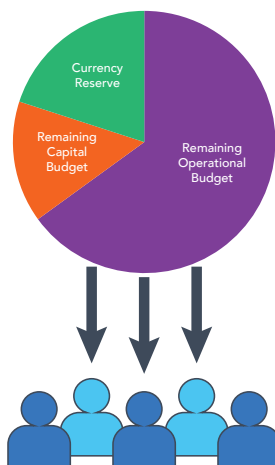
In the event that Tru Ltd should fail to discharge a Milestone fully before the Deadline expires, a Refund Event will occur to return all remaining funds to Token Sale participants proportionally to their participation. The refund will consist of the following:

- *The remaining Operational Budget* – less any Funding Tranches released to that point.
- *The remaining Capital Budget* – less any capital expenditure noted by the Advisory Board to Token Sale participants in the quarterly minutes and less the cost of KYC/AML expenses for refunds (if applicable).
- *The entire Cryptocurrency Reserve*.

Refunds will be issued in the same cryptocurrency as participants used to fund the Token Sale, minus any transaction costs, to cryptocurrency wallet addresses kept on file from the KYC/AML process in the Token Sale unless otherwise notified of a change in address with appropriate verification of ownership of both addresses.

Tru Reputation Protocol Technical Overview

Tru Reputation Protocol

The Tru Reputation Protocol works by connecting transactions to feedback and linking them to a single profile that links to all of your digital identities. It does this using five components:

- Tru Reputation Profile
- Tru Reputation Feedback Algorithm
- Tru Reputation Oracle Service
- Tru Reputation Smart Contract
- Tru Reputation Tokens

Acting in concert these four components establish the **Tru Reputation Network**- a distributed platform that leverages the *Tru Reputation Protocol* to ensure persistent, non-repudiable reputation across Web 2.0 and Web3 platforms.

Tru Reputation Profile

The *Tru Reputation Profile* provides a persistent mechanism of linking transactions committed on any platform to a central reputational profile- everything from Web 2.0 accounts such as Facebook to Ethereum or Bitcoin wallets can be connected to a *Tru Reputation Profile*. In turn, *Tru Feedback* is linked to that *Tru Reputation Profile* by the transactions associated with it, and both are stored in the Ethereum Blockchain. This ensures a **complete non-repudiable reputational profile.**

## Tru Reputation Feedback Algorithm

Step 1. A **Transaction** occurs between two or more parties.

Step 2. All parties involved in the **Transaction** select **Tru Feedback.**

Step 3. All **Tru Feedback** is kept private until consensus or 1 week without objection elapses.

Objection Raised

Consensus Reached

Step 3a. If an objection is raised, adjudication occurs.

Step 4. **Tru Feedback** & **Transaction** added to **Tru Reputation Profile**
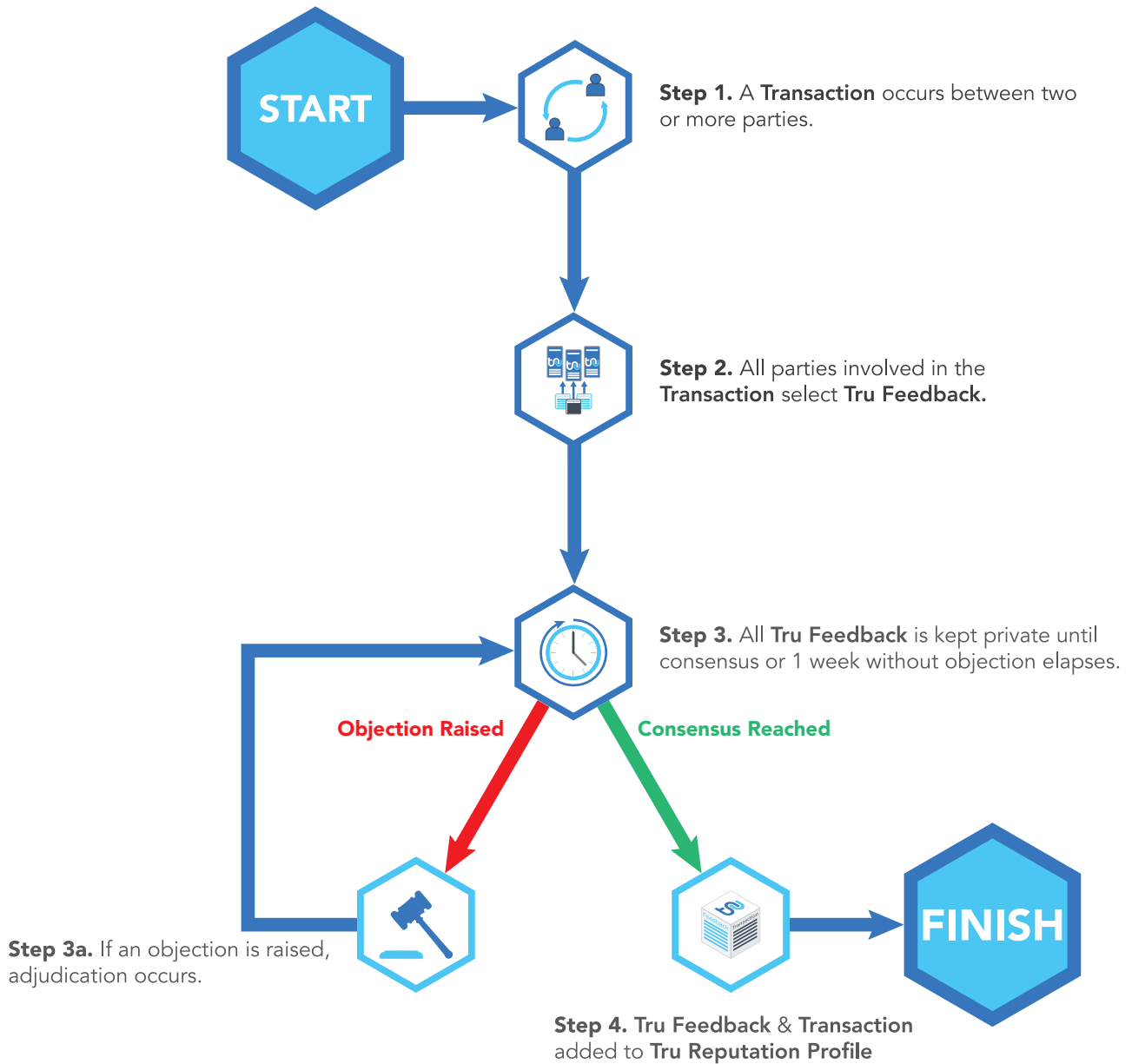
The *Tru Reputation Feedback Algorithm* provides a mechanism to provide unbiased and verifiable feedback on a *Transaction*[17] between two or more parties.

By selecting *Tru Feedback*, each party in a *Transaction* provides feedback on all other participants in the *Transaction*. Once all *Tru Feedback* is submitted, it is stored privately, and the parties have one week to raise any objections. If there are no objections, the *Tru Feedback* is made publicly available. If there are objections, a further consensus round continues and may require external adjudication to resolve by an automated bot or human intervention. Once consensus is achieved between all involved parties, all *Tru Feedback* becomes publicly accessible.

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[17] '**Transaction**' in the context of this section is defined any exchange of value between two or more parties.
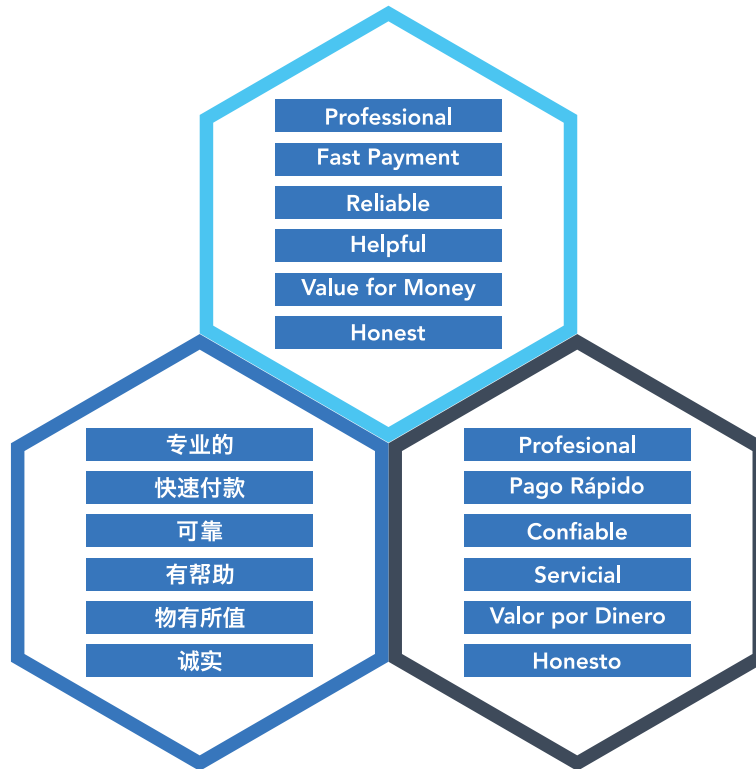
The *Tru Feedback Algorithm* has an ever-growing list of *Semantic Terms* with the built-in capability for additional *Semantic Terms* to be crowdsourced. In addition, the *Tru Feedback Algorithm* provides instant translation of *Tru Feedback* into any human-readable language. This innate capability ensures that **reputation persists geographical areas and language barriers**.

Tru Reputation Oracle Service

The **Tru Reputation Oracle Service** acts as the global interface for the *Tru Reputation Smart Contract*. It allows off-Blockchain access to *Tru Reputation Profiles* and all associated data whilst providing a user-friendly interface. The *Tru Reputation Oracle Service* also allows the *Tru Reputation Smart Contract* to query off-Blockchain resources to retrieve the latest Tru Reputation Feedback schema and translations as well as verify linkages for *Tru Reputation Profiles* to off-Blockchain Platforms.

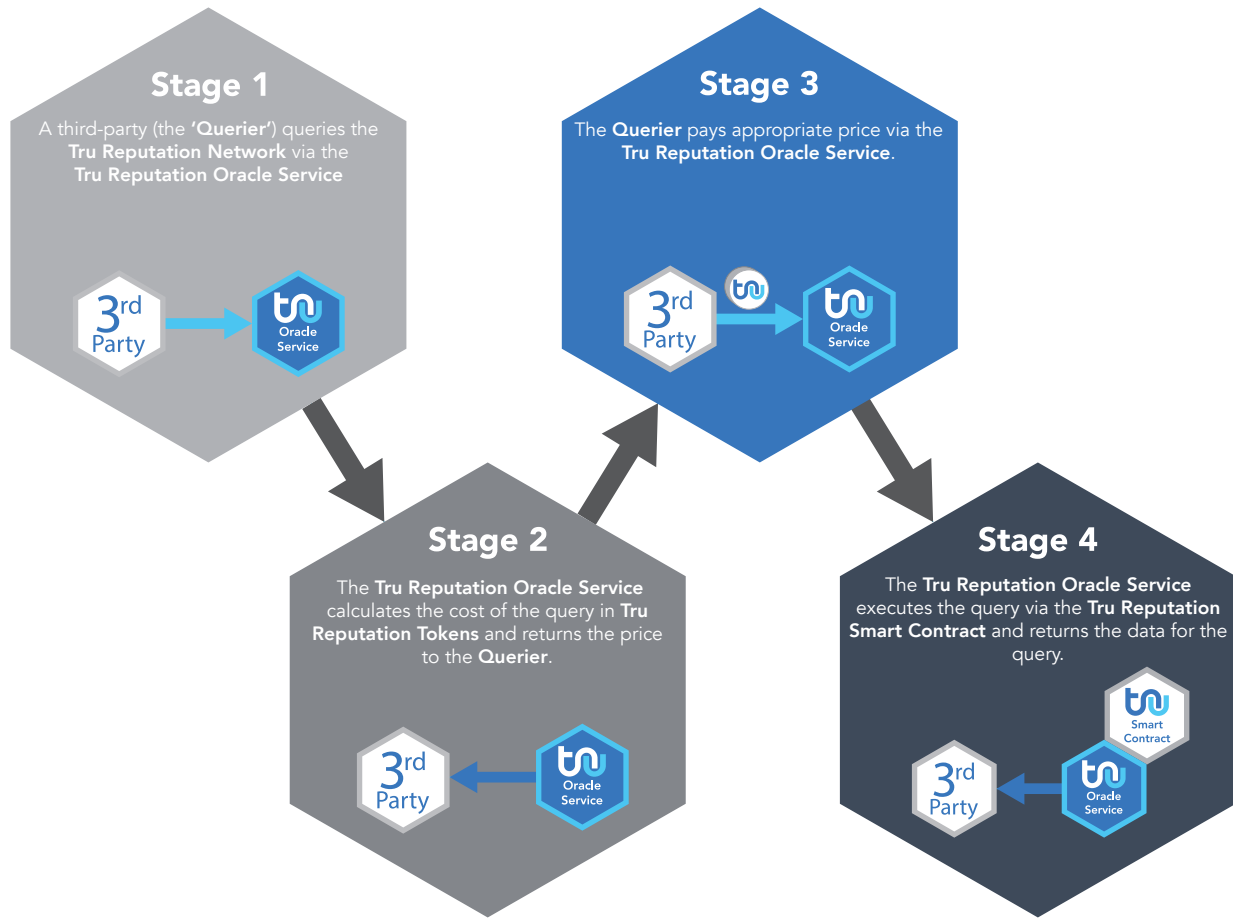Tru Reputation Oracle Service – Adding Reputation Data Workflow
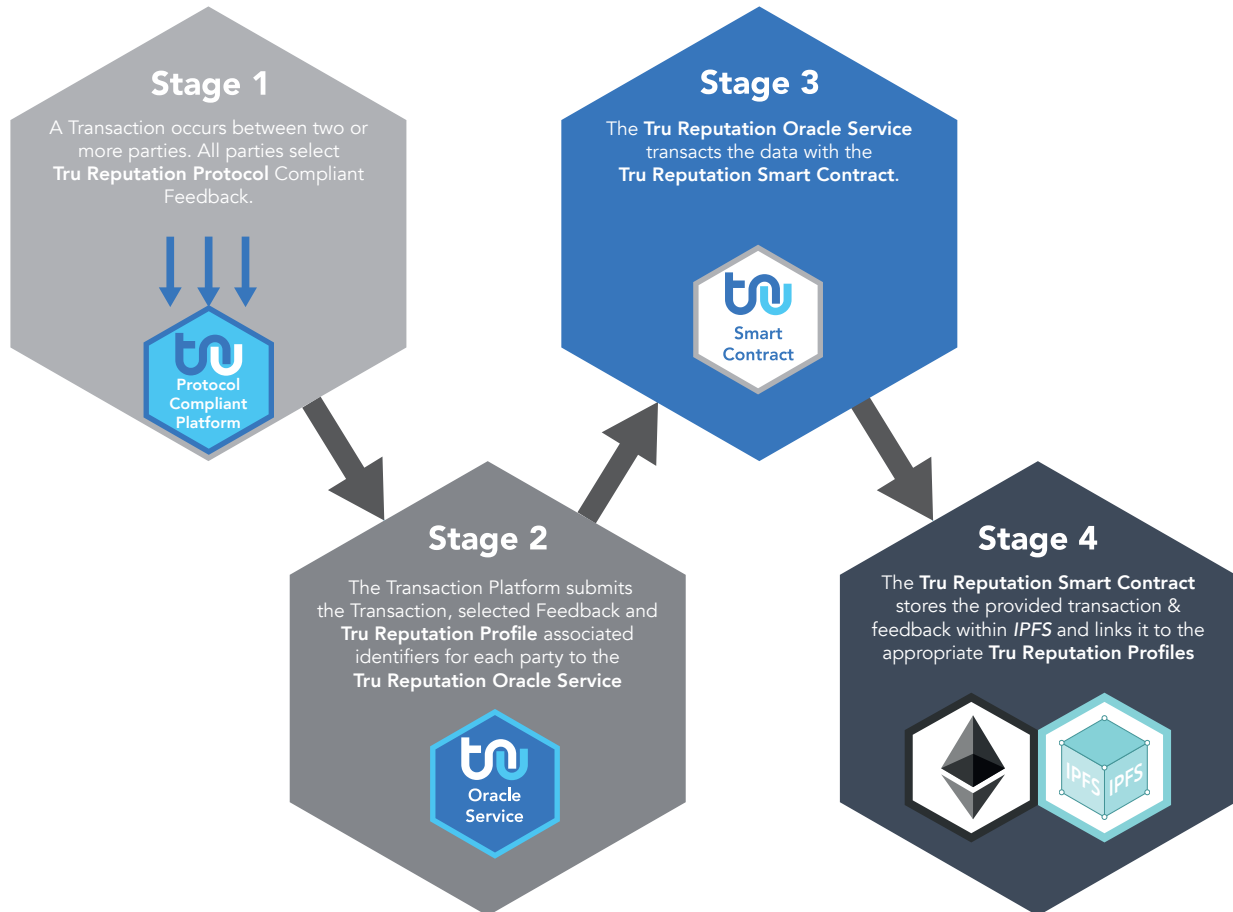
As illustrated above, adding Feedback to the Tru Reputation Network via the Tru Reputation Oracle Service is a four-stage process:

Stage 1 A **Transaction** occurs on a *Platform*[18] between two or more parties. Each party involved in the transaction selects **Tru Reputation Protocol Compliant** feedback to describe how they felt the transaction went and what they think of each of the parties involved.

Stage 2 The *Transaction Platform* submits the Transaction, the selected Feedback and the *Tru Reputation Profile* identifiers for each party involved to the *Tru Reputation Oracle Service*. If a party does not yet have a *Tru Reputation Profile*, one will be automatically created by the *Tru Reputation Oracle Service*.

Stage 3 The *Tru Reputation Oracle Service* interfaces with and submits the data provided to the **Tru Reputation Smart Contract**.

Stage 4 The *Tru Reputation Smart Contract* creates encrypted artefacts containing the Transaction information and Feedback in **IPFS** and the **Ethereum Blockchain**. The Tru Reputation Profile for each party is updated to reflect the new Feedback.

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[18] Any platform that can support transaction between two parties. For example: a digital exchange or a digital marketplace

Tru Reputation Oracle Service – Querying Reputation Data Workflow

As illustrated above, adding *Reputation Data* to the Tru Reputation Network via the Tru Reputation Oracle Service is a four-stage process:

Stage 1   A **Querier**[19] sends a search query to the *Tru Reputation Network* via the *Tru Reputation Oracle Service*.

Stage 2   The *Tru Reputation Oracle Service* calculates the cost in *Tru Reputation Tokens (TRU)* for the query and returns that to the *Querier*.

Stage 3   The *Querier* pays the appropriate price via the *Tru Reputation Oracle Service*.

Stage 4   Upon confirmation of the correct payment to the address, the *Tru Reputation Oracle Service* executes the query via the *Tru Reputation Smart Contract* and populates the query data in the retrieval link.

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[19] A person, entity or company performing executing a search against the *Tru Reputation Network*

Tru Reputation Oracle Service – Querying Reputation Data Pricing Calculation

Where:

EgP = Ethereum Transaction Gas Price in TRU

Hf = Tru Reputation Token Holders Fee (50%)

Qp = Query Price

Tf = Tru Network Fee (50%)

sQ = Size of Query

DeP = Demand Equilibrium Price of TRU

Then:

$$Qp = (DeP \times sQ) + (EgP + ((EgP \times Tf) + (EgP \times Hf)))$$

Tru Reputation Oracle Service – Creating Reputation Data Pricing Calculation

Where:

EgP = Ethereum Transaction Gas Price in TRU

Tf = Tru Network Fee (50%)

SeP = Supply Equilibrium Price of TRU

Hf = Tru Reputation Token Holders Fee (50%)

As = Total Award for Contribution

Np = Number of Participants in Transaction

Pa = Participant Award

Then:

$$Aw = SeP - (EgP + ((EgP \times Tf) + (EgP \times Hf)))$$

And:

$$Pa = Aw / Np$$

Tru Reputation Protocol Roadmap

The following outlines the current minimum viable Tru Reputation Protocol Roadmap:

Release 1
Pre-Sale + 2-4 Months

- Beta release of Tru Smart Contract
- Beta release of Tru Reputation Profile
- Beta release of Tru Oracle Service

Release 2
Crowd Sale + 4-6 Months

- v1.0 release of Tru Smart Contract
- v1.0 release of Tru Reputation Profile
- v1.0 release of Tru Oracle Service
- Beta release of Javascript Library
- At Least 2 Partner Platforms in Tru Reputation Network

Release 3
Crowd Sale + 9-12 Months

- v1.0 release of Javascript Library
- v1.0 release of iOS Library
- v1.0 release of Android Library
- At Least 10 Partner Platforms in Tru Reputation Network

Release 4
Crowd Sale + 12-18 Months

- v1.0 release of Machine Learning Library
- Beta release of Tru Reputation Analytics Service
- At least 30 Partner Platforms in Tru Reputation Network

Conclusion

The *Tru Reputation Protocol* provides a new standard for feedback, reputation and reviews- both on the blockchain and off the blockchain. The *Tru Reputation Protocol* provides the first truly platform agnostic, persistent platform for reputation in any digital context and also establishes a market value for Reputational Data as well as the act of providing feedback. **This system proposes and creates the first unbiased, distributed, and persistent solution for the problem of reputational trust in digital environments and for the first time establishes a Proof of Reputation**.