The Open Source

SERATIO PLATFORM ARCHITECTURE

Sandbox for Non-Financial Enterprise

CCEG Blockchain UN Lab

impact investment | humanitarian | provenance | values

Maryam Taghiyeva, Sajin Abdu, Dinh Ho Nho Thong, Daniel Kaminski De Souza, Roy Zou, Dr Will Wise, Barbara Mellish, Prof Olinga Ta'eed

Seratio Whitepaper 4.0

THE OPEN SOURCE: Seratio Platform Architecture

Sandbox for Non-Financial Enterprise Solutions

Seratio Blockchain White Paper 4.03

29th March 2017

Essential Reading*:* preceding white papers on Github

Seratio Blockchain 1.0: Currency of Intangible Non-Financial Value [1]
Seratio Blockchain 2.0: Values Based Impact Interventions
Seratio Blockchain 3.0: Proof-of-Impact Transaction Platform

Blog site*: CCEG Blockchain UN Lab*[2]

Proof of Concept: *blockchain.seratio.com*

Development Teams: *Brazil, China, India, UK*

Schedule*: (Beta) Autumn 2017, (Release) Q4 2017*

Description*: An open source blockchain transaction platform enacted by non-financial Proof-of-[…] metrics that govern the extent of the transaction and evaluate the benefits*

Abstract*: An Ethereum based platform with integrated S/E Ratio SaaS offering both general tokenised and cryptocurrency solutions which are enhanced by or dependent upon intangible non-financial value. The Seratio blockchain platform is available free to CCEG Blockchain UN Lab members who collectively determine the direction of work. The platform is available for non-commercial use or as a development sandbox. There is a path to enterprise level implementations.*

Key words: *sandbox, architecture, lab, blockchain, seratio, microshare*

Contact*: blockchain.lab@cceg.org.uk*

[1] https://github.com/seratio/whitepaper

[2] http://mypad.northampton.ac.uk/cceg

Definition List

S/E – Social Earnings Ratio is single-number metric for capturing & translating non-financial (intangible, soft) value. It unites all non-financial attributes together. S/E is the basis on which all the prodigy metrics are founded on, e.g. Personal Value (P/V), Modern Slavery, Ethical Leadership, Family Value, Country Value, etc. In this document, it represents a family of metrics that are S/E compliant. S/E is a translation tool for all other non-financial metrics.

Seratio API or **SAPI** - value assessment software.

Platform User or **User –** individual who uses the platform or its services.

Rewarding Body – a trusted entity, whether an individual, organisation, institution, or government body (NGO, charity organization, Mosque, etc) that is authorized to trigger token issuance.

Retail – collective term for any entity (Local Grocery, Café, Hotel, Tourist Agency, etc) that sells goods or services. A retailer can be the Rewarding Body.

QR Code – Quick Response Code, is a machine-readable optical label that contains information about the item to which it is attached. In the context of this paper it will represent the encrypted S/E Certificate of the User / Rewarding Body / Retailer.

Token or **Coin –** single cryptocurrency unit.

Altcoin (Alternative Coin) - any cryptocurrency that is not Bitcoin.

Token / Coin Issuer or **Client –** collective term for the Purpose / Individual / Organisation behind a certain cryptocurrency.

Seratio Tokens / Coins - family of Seratio Assured Branded coins (Carers Coin, Mencap Coin, Muslim Coin, Students Coin, etc.). Seratio Coins are native coins of the Seratio platform and carry a guaranteed value and settlement promise.

Inner Wallet - embedded digital wallet for the platform-native tokens.

Outer Wallet - externally owned digital wallet which is connected to the Seratio platform.

Hot Wallet - online digital wallet, that is assets in the wallet are connected to the internet and kept online.

Cold Wallet - offline digital wallet, that is assets in the wallet are not connected to the internet but kept in an offline (cold) storage.

Artificial Intelligence Wallet or **AI Smart Wallet –** Smart wallet (or bot) that suggests individual / entity options that are aligned to the individual's / entity's values.

Rewards Policy – policy set to determine token rewards. Smart Contract operated.

Oracle - communication protocol that maintains data exchange between on-chain and off-chain worlds, that is smart contracts and external components (SAPI, add-on services, etc.).

Service ICO (Initial Coin Offering) – fundraising campaign set to raise assets for the service development (e.g. Provenance Software).

Token ICO (Initial Coin Offering) - cryptocurrency fundraising campaign.

BaaS – Seratio Blockchain as a Service offering

Microshare – voting layer in blockchain converted to a share layer

1. Platform Overview

The Seratio Enterprise Blockchain Platform is an all-in-one blockchain environment (platform) that enables beneficiaries to keep track of the value and impact they make, and most importantly profit from it in many different ways. The platform allows entities (whether individuals, companies, organisations, institutions, etc) to earn, transact, spend, trade and monitor their digital assets. Precisely, our vision for the Seratio blockchain platform is to unite and manage under three key themes:

- Cryptocurrency (financial assets) linked to intangible value and sets of values
- Tokenised Currency (non-financial assets) linked to intangible value and sets of values
- Provenance (both financial and non-financial assets) traceability recording and tracking

Cryptocurrencies with the purpose of storing value like Bitcoin are the natural choices to represent financial assets. On the other hand, Ethereum tokens were chosen to represent non-financial assets. Each theme is distinct although linked by the common use of tracking, recording and predicting the non-financial value of the asset(s) being transacted or transferred.

The Seratio Enterprise Blockchain Platform helps emerging and existing ventures (business, social, not-for-profit) maintain and expand their market presence while keeping and demonstrating alignment to a specific set of values. That becomes possible through several impact analysis & tracking services, including Modelling, Predicting and Visualization Engines as well as Complex Reporting and Mapping tools.

The S/E Ratio is the main mechanism used for maintaining platform services and therefore "S/E" represents a generic term describing various prodigy metrics, such as organisational Social Value, Personal Value, Modern Slavery, Ethical Leadership, etc. S/E and its prodigy metrics are behind Proof-of-[…] tools. For example, Proof-of-Impact may incorporate organisational social value in the core, whilst Proof-of-Value may use the Personal Value metric; it is a mix and match system based on need. Besides, S/E is the universal translator – a metric that unites all the other social metrics into a single non-financial attribute which can be further employed in financial and tokenised systems. [3]

This base blockchain architecture code set is an open source development free to CCEG Blockchain UN Lab members/shareholders:

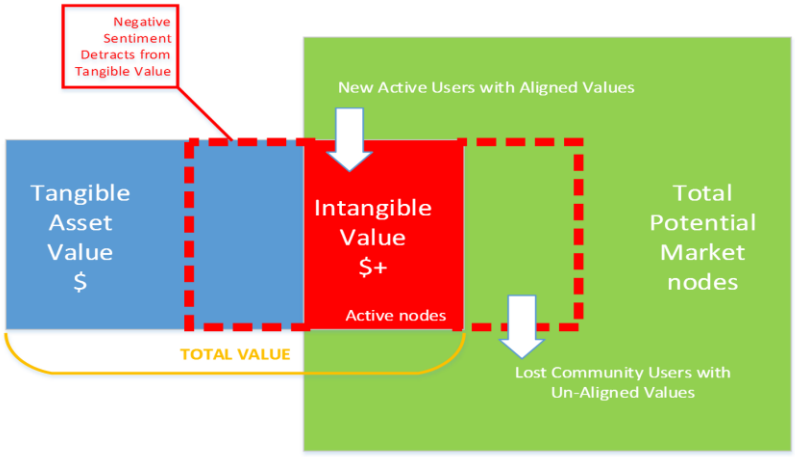
- To take away to freely implement for non-commercial use
- To experiment within the Seratio blockchain platform sandbox to trial out ideas
- To use the Seratio Enterprise level blockchain platform for commercial use as an offered Seratio BaaS (Blockchain as a Service).
- To use on a commercial basis on payment of license fee

2. Architecture

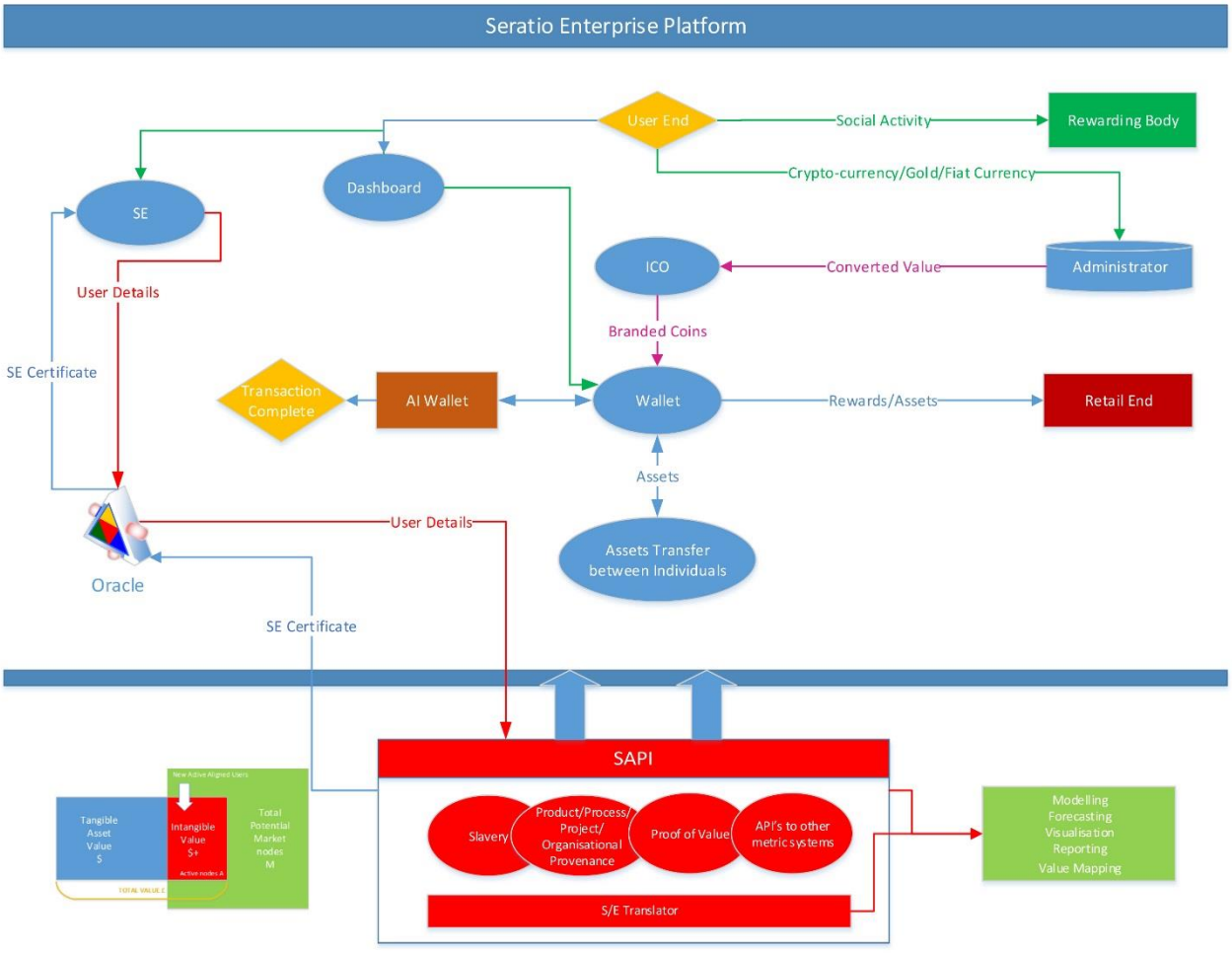
The Seratio Enterprise Platform is a multi-layered environment that marries a secure financial or tokenised system with a complex, highly efficient and real-time non-financial engine. Financial/Token ecosystem of the platform is powered by the blockchain technology and non-

[3] Seratio Whitepapers, GitHub

financial analysis is carried out via Seratio API. Since the ability to transact financial value is a fundamental feature of the blockchain, and assessment of the non-financial value is possible through SAPI and Social Earnings Ratio (S/E), we can therefore capture total value - both financial hard value and non-financial soft value. Combination of the two is the Seratio Blockchain - the blockchain that offers all the benefits of the blockchain and is also enriched with ability to translate, measure and monitor non-financial (social) value. With that, Seratio Blockchain enables individuals and ventures to control their financial and asset decisions and do so in the most aligned way.



The above summary diagram represents financial (tangible, hard) value which is operated by means of the blockchain technology, whereas the red part is the non-financial (intangible, soft) value that is



governed by the Seratio API (SAPI). The green part is the market performance of the broader community. This general architecture of the Seratio Platform reflects the above structure.

2.1 Seratio API (SAPI)

The Seratio API is the software that implements impact assessment & tracking (non-financial value analysis) for the Seratio Enterprise Blockchain Platform. It is responsible for S/E scores calculation, S/E certificate awards, and also has a build-in S/E translator enabling engagement and use of all other non-financial metrics . This translator can process and combine different data sets, including monitoring product provenance, modern slavery conditions checks, Proof-of-[…] metrics, and convert them all into a single-number non-financial attribute - S/E score. This attribute is further used in the platform services.

SAPI is connected to the platform by means of an oracle. Information collected by the platform information is stored in the SAPI and not on the platform which minimizes the chances that private data will be compromised during transactions. Additionally, the oracle may be dependent on several SAPI data flows eg. Proof-of-Impact AND Proof-of-Trustworthiness AND Proof-of-Knowledge…. etc.

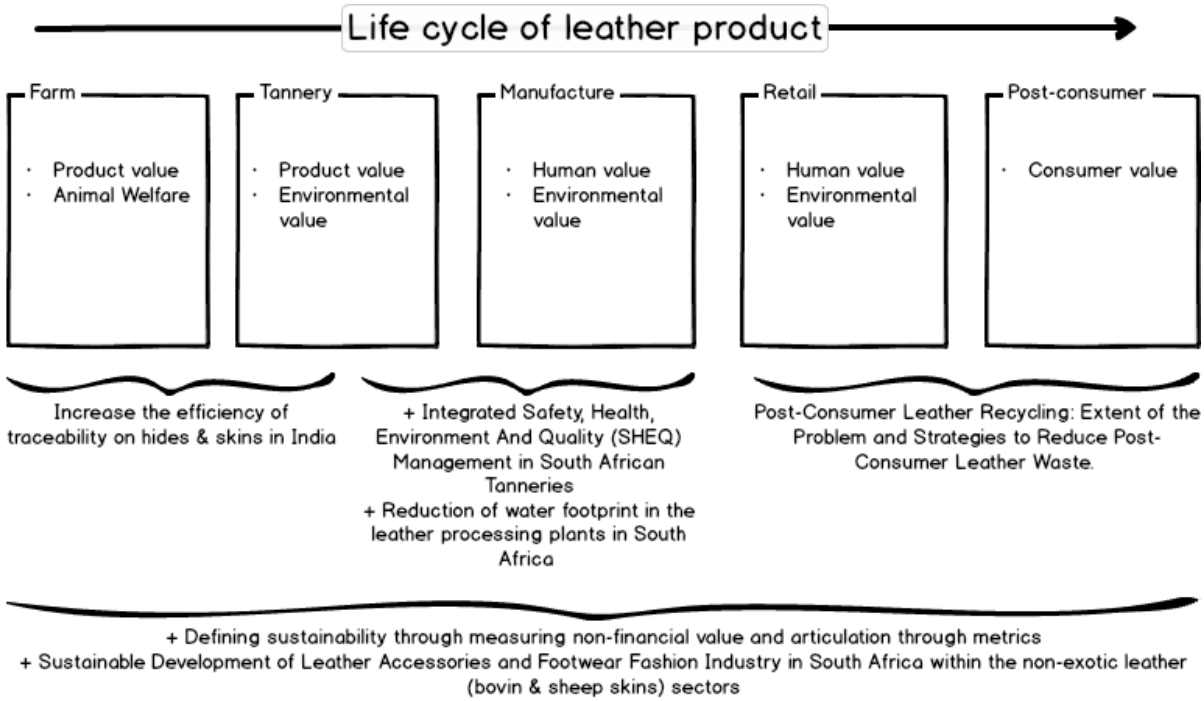
Together with financial data from the platform, SAPI manages several S/E based services – Modelling Engine, Predicting Engine and Visualization Engine, Complex Reporting, Mapping tools. These components are designed separately and then integrated into the platform. For example, the Modelling Engine allows the user / entity to model the impact it makes in the present time – it gives the user / entity opportunity to access created impact and change behaviour / policy to maximize it (impact). The Predicting Engine shows future impact patterns that depend on the input data set – it helps the user / entity to amend its behaviour / policy to improve its impact performance. The Complex Reporting offers a sophisticated non-financial analysis and the Mapping tool enables real-time impact tracking.

2.1.1 Provenance Monitoring

One of the main features of the SAPI is the Provenance Monitoring software. The Provenance Monitoring is an S/E based complex analytical tool which allows tracking provenance of products, companies, services and etc. Tracked and S/E processed data is sent back and forward from SAPI to the Seratio Enterprise Blockchain Platform where it is securely registered and stored within the block anonymously. The Provenance Monitoring software is a separately designed software that is integrated into the Seratio API. It is powered by R programming. Our R choice is determined by the functionality (data tools; libraries of function for hypothetical and practical applications, computational statistics and the hard sciences affinity) and flexibility (integration with other programming environments, in our case Solidity, C#, PHP Laravel, My SQL, etc.) this programing environment provides. The main aim for using R-supported software is to collate data from multiple data sources and to further assist homogeneous standardisation of data sets through the S/E translator.

For example, for the leather industry the Seratio Platform will represent a decentralized distributed system that uses Seratio blockchain to collect, store and manage key product information of each leather product throughout its life cycle. Product information includes both tangible (financial hard)

attributes of all the stages of production & distribution as well intangible (non-financial soft) ones. This creates a secure, shared record of exchange for each product along with specific product information, such as animal husbandry at the farm, modern slavery conditions in which the product was processed, environmental issues surrounding the use of chemicals, retail interventions and post-consumer stages through to the land-fill.



Combining our expertise with existing supply chain knowledge [4], we envisage the platform to perform in three main stages.

(i) **COLLECTING DATA** As the product moves through its life cycle, the blockchain is populated by a variety of actors, for example, producers, suppliers, manufacturers, distributors, retailers and finally the end consumer. Each of these actors play an important part in this system, logging in key information about the product and its current status on the blockchain network. Each product will have a unique digital profile - a 'passport', that will contain all related information, each processed by S/E software during various life cycle stages.

This proposed system consists of several types of actors:

• Registrars – provides unique identities to actors on the network.

• Standards Organizations – defines standards schemes (such as Fairtrade)

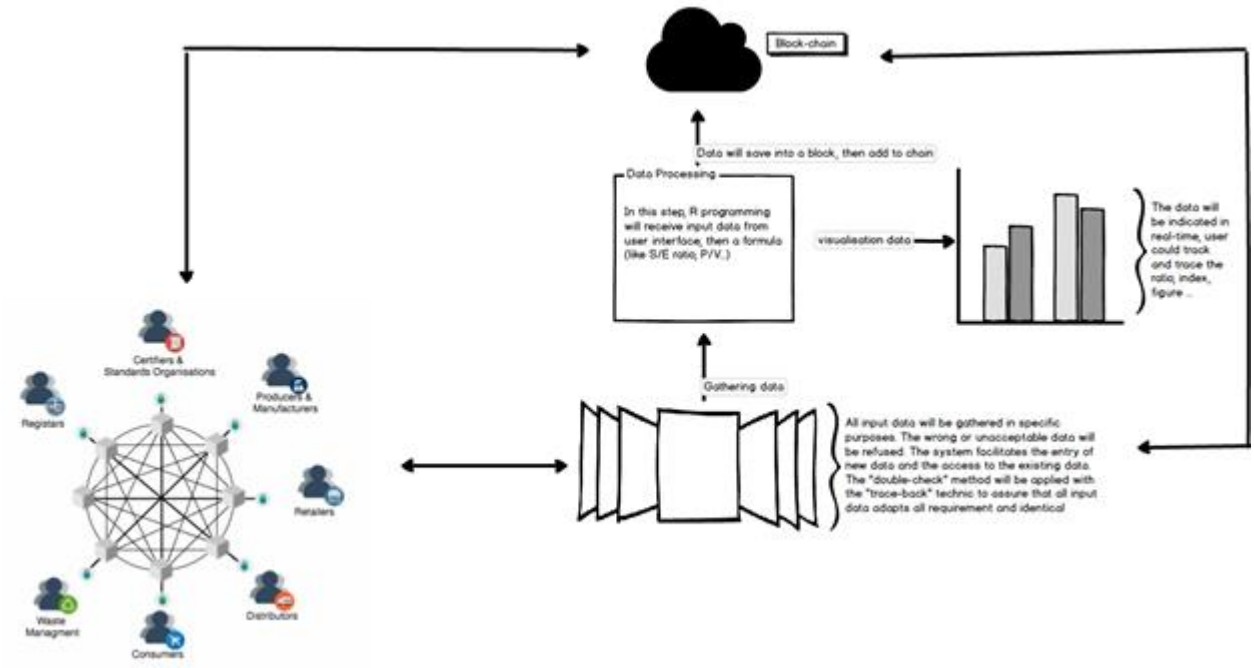
[4] Abeyratne, S. A., Monfared, R. P. "Blockchain Ready Manufacturing Supply Chain Using Distributed Ledger", 2016, International Journal of Research in Engineering and Technology, 05(09), pp 1-10.

• Certifiers – provides certifications to actors, which allow them to participate in the network.

• Producers, manufacturers, distributors, retailers and waste management organizations – enter key product specific data to the blockchain

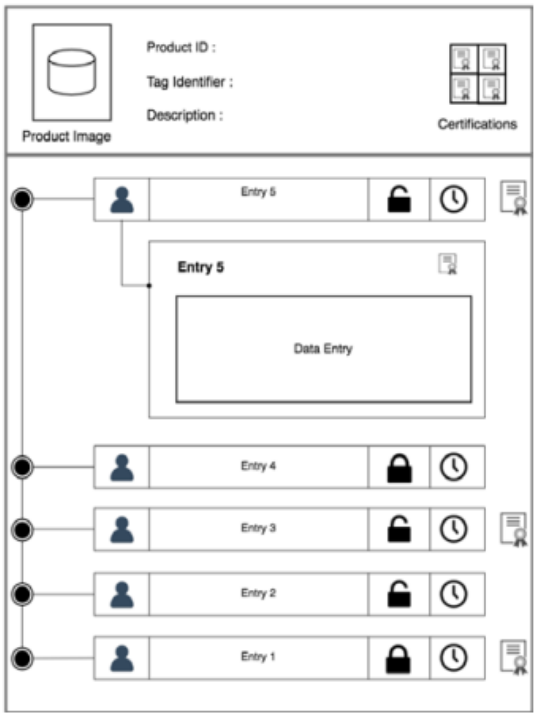
• Consumers – purchases products, and in some cases, are allowed to enter product data to the blockchain.

Framework of Seratio Platform for Leather Industry



(ii) **GATHERING DATA** In this stage, all data collected from the previous stage will be gathered and compared with the data already stored in the Seratio blockchain. This is a double-check process required to assure that all collected input data is identical & acceptable.

(iii) **CALCULATING DATA** Collected data will be transmitted to the SAPI where R-powered S/E computations will be carried out to record and store the intangible values, or proof of 'xxx' at that stage of production / life cycle. The result will be shown articulated in the specific purposes of user. The processed data will then be encrypted and sent back to the Seratio Enterprise Blockchain Platform.



Each physical product in the Seratio Enterprise Blockchain Platform has a 'passport' - digital presence in the blockchain network, so that all stakeholders of that product can have direct access to the product passport. The digital presence in the blockchain is necessary to enable trades and to update product information to be attributed. Using the digital identities of the actors and products, it is possible for a smart contract to be created for each product in form of rules, so that only the parties with the correct digital keys have access to that product. At a given time, a product is 'owned' by a particular actor. Only this actor has the permission to enter new information into that product's passport or initiate a trade with another party. Therefore, when the product is transferred (eg sold) to another actor, both parties must authenticate a digital contract to enable the exchange. Once all parties have authenticated the contract, the details of the transaction will be added to the blockchain.[5]

At every stage of leather goods production (farm, abattoir, tannery, brands) unique data will be added to the product passport and distributed. For example, the chemical tanning process details will be added in the product passport before the leather material transforms into a footwear product and so on, step by step. The passport of the final product thus will contain all the history of the product's production and distribution process.

2.1.2 Provenance of the Past, Present and Future : "Golgotharism"[6]

Of course, provenance traceability applies to all products, processes, projects, organisations and even our own lives. Knowledge procurement lends itself well to the idea of 'passports' that follow student lives and can demonstrate to future employers not only proof of our certificated skills, but also the 'in-between-the-lines' knowledge acquisitions that form a complete skill set.

Golgotharism[6] lends itself to a future projection of provenance by suggesting that the blockchain passport also carries information of (likely) future performance. To what extent this is achieved can be assessed, for example, through a Proof-of-Trust mechanism where a time constrained recent past performance would be an indicator of future potential performance. Such trust networks are the invention of Alex Todd[7] which effectively can be interpreted as a forward projection of S/E which traditionally has recorded past and present non-financial performance. It could be argued that S/E is already used in forward looking processes such as public sector procurement decisions. This has wholescale implications around a host of future performance beyond the remit of this whitepaper.

2.2 Seratio Blockchain Platform

The blockchain platform employs the Ethereum protocol for its transactional services hence adopting Ethereum Smart Contracts. Given that, the main programming language of the platform is

[5] *Product Passport Template (source)*

[6] "Golgotharism is the artistic, literary or theatrical expression of an object(s) past, present and future simultaneously. When reverence is given to the origins and future of the object - as well as its present - then we come to a point, where we are cultivating 'reverence' for every aspect of our being as it travels through time-space" – Tigris Ta'eed (2017) http://ow.ly/u9Vw30anNJL

[7] www.trust2pay.io

Solidity. The Integration with the external off-chain components is implemented through Oracles.

The unique feature of the platform is that before every transaction our value checks are performed through Ethereum smart contracts. Values checks are a set of receiving S/E criteria that the user / entity determines for itself. For example, a user can set to transact only with users that have S/E equal to or more than 5 or shop at a grocery whose S/E is greater than 5. A demonstrator Proof-of-Concept platform is already available[8].

2.2.1 Wallet Overview

Upon registration, every user is assigned a within-the-platform wallet - so called 'Inner' wallet. This wallet can store many platform-native coins. For example, one can have Seratio coins as well as Muslim coins on his/her balance: user chooses what coins to spend from the dropdown list.

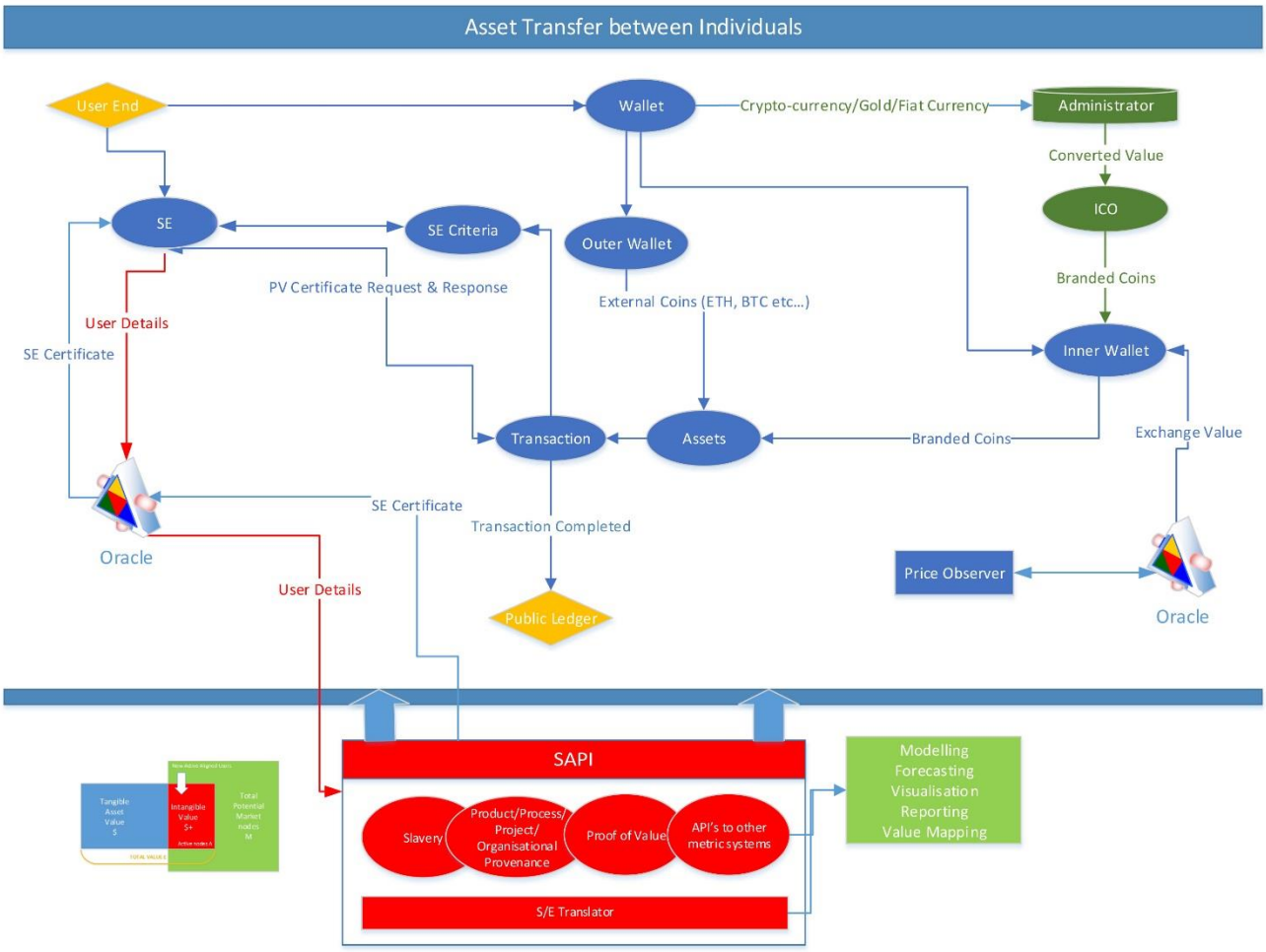
Users can also connect their existing (e.g. BTC, ETC/ETH) wallets to the platform. In this case the platform will show the user a few separate wallets:

- 'Inner' wallet for platform-native tokens (e.g. Mencap coins/Womens coins/Muslim Coin).
- 'Outer' wallet(s) for other coins (e.g. BTC)

Initially, users can connect 2 other wallets (e.g.BTC and ETC) so the total number of the wallets a user can hold is 3: 1x inner + 2x outer. 'Inner' and 'Outer' wallets are separated in order to avoid mixing assets. Later, when Seratio tokens are traded, 'Inner' wallet will have ShapeShift (hassle free cryptocurrency exchange) services built in which eases the process of exchanging Seratio tokens for BTC, ETC/ETH and other altcoins. User-to-user transactions from outer wallets obey general S/E rules of the platform, namely users set their transacting S/E criteria. Initially the wallets will be "hot", i.e. online. After the launch "cold" wallets functionality will be added for added security.

For tokens, a Rewarding Body's S/E score determines the initial amount of Seratio tokens that are available (minted). Allocation to individuals can be made by the Rewarding Body into a user wallet. Tokens may also be bought for fundraising in a Service ICO and for cryptocurrency issued on the Seratio Enterprise Blockchain Platform via a traditional style ICO; other methods of minting below.

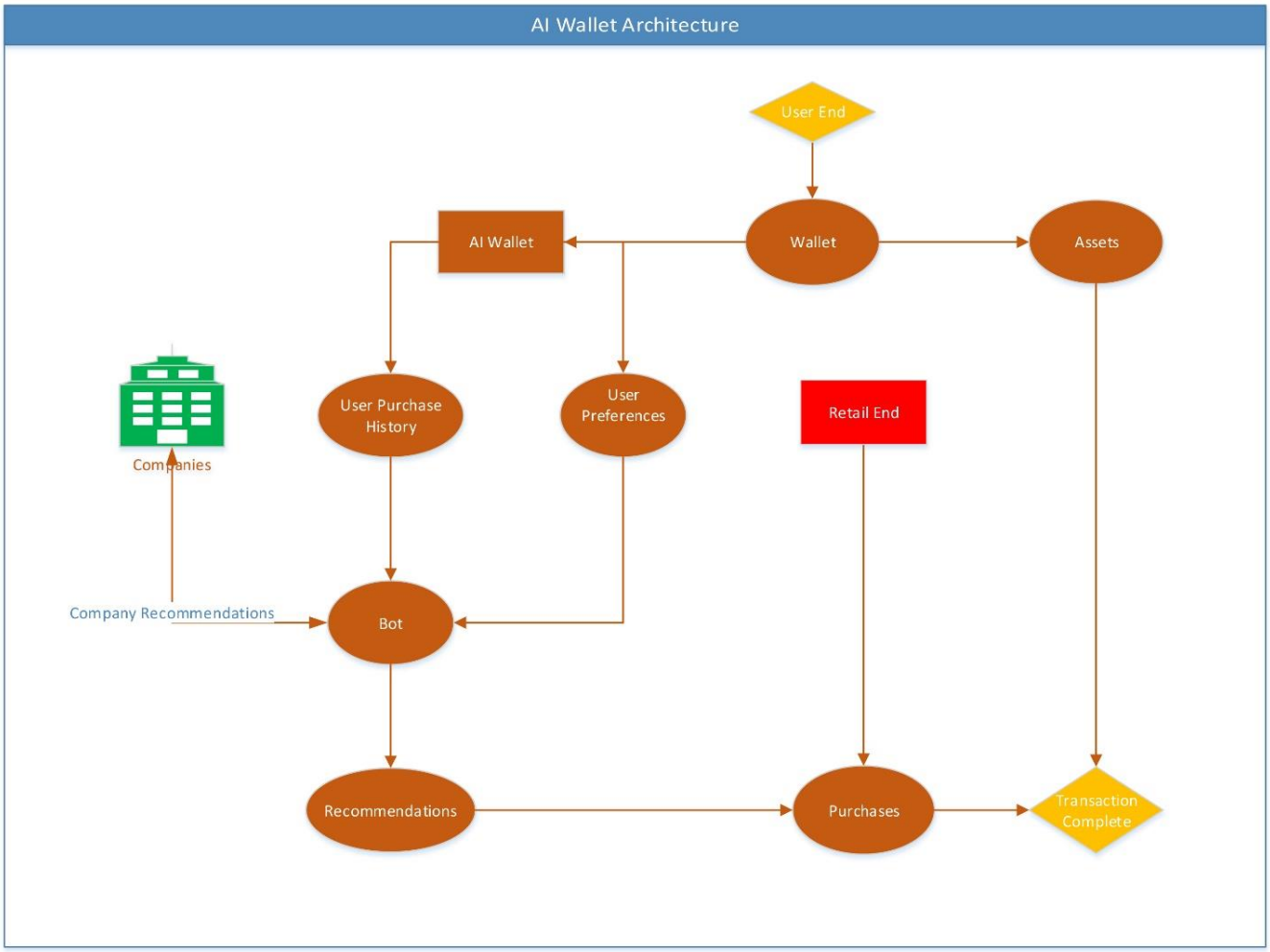
[8] http://blockchain.seratio.com



2.2.2 AI Smart Wallet

The mobile version of the platform and the web version has an integrated AI Wallet.[9] The AI Wallet (or bot) is a smart wallet that processes many different attributes, the main one of which is S/E score, and then the bot suggests user best choices. It has a simple slider or multi-star form interface, which nonetheless can analyse user's attitude to complex matters such as product provenance. It recommends user / entity products that are aligned to the given set of values and can also suggest a few choices that do not meet given set of values but are still a compromise. Although collected data is used to advise the user, the data itself is stored in SAPI. If the user chooses to automate the process, the AI Wallet can also select the best option and finish the purchase itself. Additionally, organisations can recommend to a profiled community a range of products that will match their values – also captured by S/E. So not just products similar to the ones the user buys, or "other users also purchased", but also identifying opportunities to take better decisions based on the values the other party has. This will involve taking multiple Proof-of-[…] S/E scores from diverse attributions e.g. the slavery conditions or provenance of the product, the organisational CSR score of the product, and use a learning AI to understand the customer.

[9] Phronesis World Videos



2.2.3 S/E Certification

Once registered, the user / entity (Rewarding Body, Retail, etc.) needs to calculate its S/E score in order to get its S/E certificate. S/E certificate is essential if the user / entity wants to use all the services provided by the platform. S/E certificates are issued by SAPI, which is an external part of the platform. Therefore, no private data is kept on the platform itself which in turn means that no personal data will get to the transactions layer – user / entity privacy is safely managed.

2.2.4 QR Codes

Adding another layer of privacy, as well speeding up transactional services, the infrastructure of the Seratio Platform also utilises a system of QR Codes. QR Codes System represents users' / entities' virtual ID. Every user / entity (Rewarding Body, Retail, etc) gets its own generated QR code which is generated by the platform once it is rewarded with a S/E certificate. These codes are used by Rewarding bodies and Retailers for the user identification. QR Codes can also be used to find other users for assets transfer or login into the platform (whether from computer or mobile).

From the technical point of view, every QR code contains encrypted information on the entity / individual, mainly its S/E certificate. For instance, for user-to-user transactions, QR codes represent the ID of every user, that is the encrypted version of the S/E certificate. Users can login into the

platform or search for other users using the QR Codes. Users will also need their QR Codes to collect their earned value from the Rewarding Bodies and claim social rewards from the Retail.

2.2.5 Coin/Token Minting

Coin minting is carried out through several ways.

- First is the earning tokens via impact that users make through their personal beliefs or social activity (volunteering, charity, carers). Impact in this case is proved and verified via Proof-of-Value mechanism. This is an automated process but regulated by the (Rewarding Body, Client). For instance, an NGO wants to reward someone for his/her volunteering. The NGO finds that person by scanning his/her QR Code and adds (Seratio, Client) token to the user wallet. The amount of the reward is set by the Rewarding Body (Client). Rewarding Body who must specifies its rewards policy in advance, and be subject to its own S/E score, ie a limited rather than unlimited issue..

- Second is impact investing backed by the FIAT currency. For example, where money is input by an organisation, institution, corporate or an individual and they get tokens to invest in various NGO's. This is a regulated process supervised by the platform administrators. Especially relevant for the time when the tokens are not allowed to be exchanged for fiat money.

- Initial Coin offerings to aligned communities or through service ICO for Fundraising is a third example. Each of these currencies hold a guarantee of value and settlement promise. Whitepaper 3.0 has more details.

Users are rewarded with specified tokens for their social activities. The Rewarding body adds tokens to the user balance directly using user's QR code. Rewarding bodies can also serve as a 'Value Validator'. Endorsement of the rewarding body is used in SAPI in the sentiment part of S/E, for example as the 'feedback' in the S/E scores.

Collected tokens can be used to claim various benefits and discounts. For that, the user needs to present his/her QR Code at the specified Retailer. The system at the retail end will find the user and show if there are any discounts / benefits to claim. Just like with the Rewarding Bodies, the Retailer specifies its rewards policy in advance upon registration. Seratio Retail End can be integrated into or be an add-on to the existing retailer system.

- S/E determines the size of the social rewards, benefits and discounts. Criteria are set by the Client. For instance, platform users with P/V equal to or higher than 10 are rewarded with 5% discount when buying coffee, users with P/V higher than 15 with 10% discount and so on.

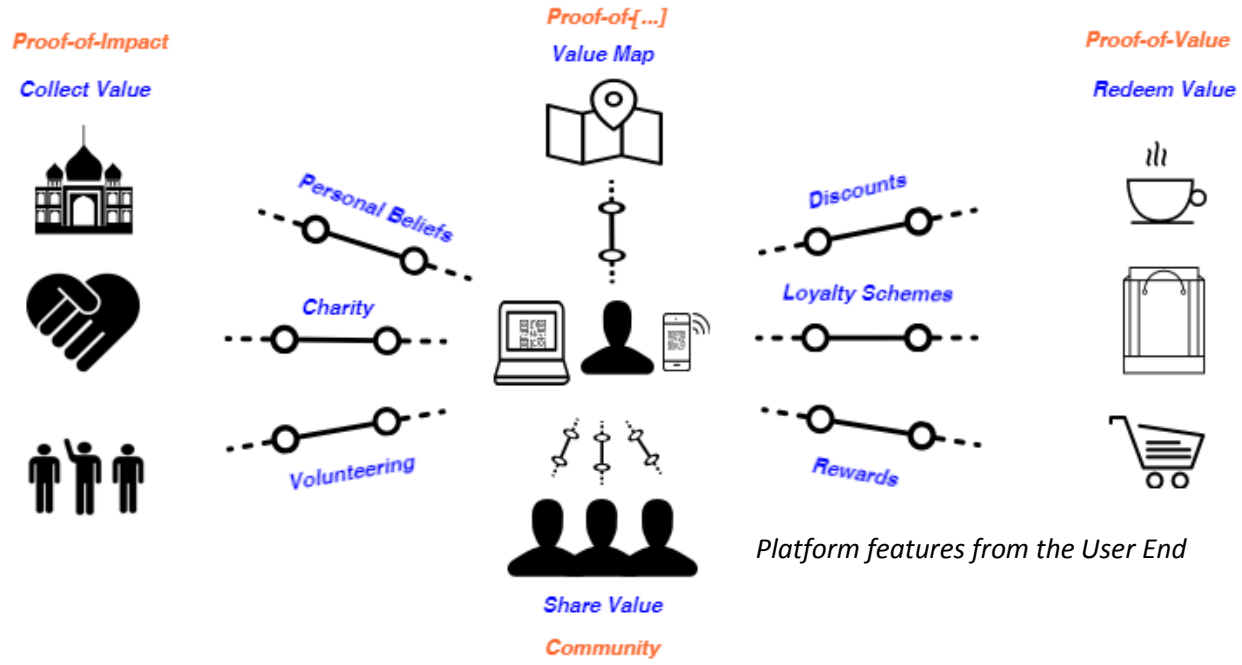
- Certain tokens can be exchanged for the discounts at the specified retailers. For instance, Muslim coins can be used to pay 5% of the order at a halal butchery. In this case, the amount of Muslim coins equal to 5% of the order should be deducted from the user balance.

We are working to include other features of the platform such as Predicting Engine, Visualization

Engine, Reporting, etc such as the West Midlands Fire Service (WMFS) pilot[10].

For ease of development, at its launch the platform functioning will be partially centralised, for eg connections with SAPI, token issuance, etc, will be authorized by the oracle. As we introduce licensed S/E providers, it is our intention for the platform to become completely decentralised.

3. User End Architecture



Platform features from the User End

3.1 User End Infrastructure

Seratio User End uses QR Codes as specified above. To make best use of the platform services, the user should set his/her receiving S/E criteria. That is made in advance (preferably, upon registration with the platform). Receiving S/E criteria is then managed by the deployed smart contracts.

3.2 Collecting Value Tokens

Users earn value (tokens) by various social activities such as charity and volunteering. They can also earn value through their personal beliefs or any intangible system for which we can construct a Proof-of-[…] SaaS metric.

3.3 Redeeming Value Tokens

Accumulated by the users value tokens can be traded and used to claim benefits.

[10] WMFS Impact Model with values alignment

3.4 Sharing Value Tokens

Unique environment of the platform allows users transact financial value anonymously yet with a proven track of credibility. At the later stages, say 12 months, users will also be able to trade tokens for fiats, BTC and/or altcoins.

3.5 Value Map

To help platform users in their daily choices, the platform offers values-based Map. The map tracks social value created by the functioning in the area entities and thus allows platform users opt for the entities with the values similar to the users' values. Value Map is one of the add-on services the platforms will provide.

3.6 Future Services

At the later stages of development, the platform will provide a number of add-on services (in addition to the Mapping): Modelling, Forecasting, Visualisation, Reporting. Decisions produced by the aforementioned add-on services are based mainly on monitoring product provenance as well as legislative compliance conditions checks and Proof-of-[…] metrics .

4. Retail End Architecture

Seratio Retail End is a system that enables retailers offer services / goods in the most customer aligned manner. Seratio Retail End can be an add-on or later integrated into the existing retail EPOS management system. NFC technology can help easing consumer`s life whenever paying for goods or services.

4.1 Retail End Infrastructure

Seratio Retail End uses QR Codes as specified above. For the further communication with the customer, Retailer should set its Rewards Policy. That is made in advance (preferably, upon registration with the platform). The Rewards Policy is then managed by the smart contract.

4.2 Collecting Value Tokens

Users earn value tokens as above or certain Retailers can offer Seratio tokens as part of their Customer Loyalty Scheme (specified in the Rewards Policy). Tokens are added to the customer balance through the QR Codes system.

4.3 Redeeming Value Tokens

Collected tokens can be used by the customers (Seratio platform users) to claim various benefits and discounts. For that, the user needs to present his/her QR Code at the Retailer. Seratio Retail End will find the user and show if there are any discounts / benefits to claim.

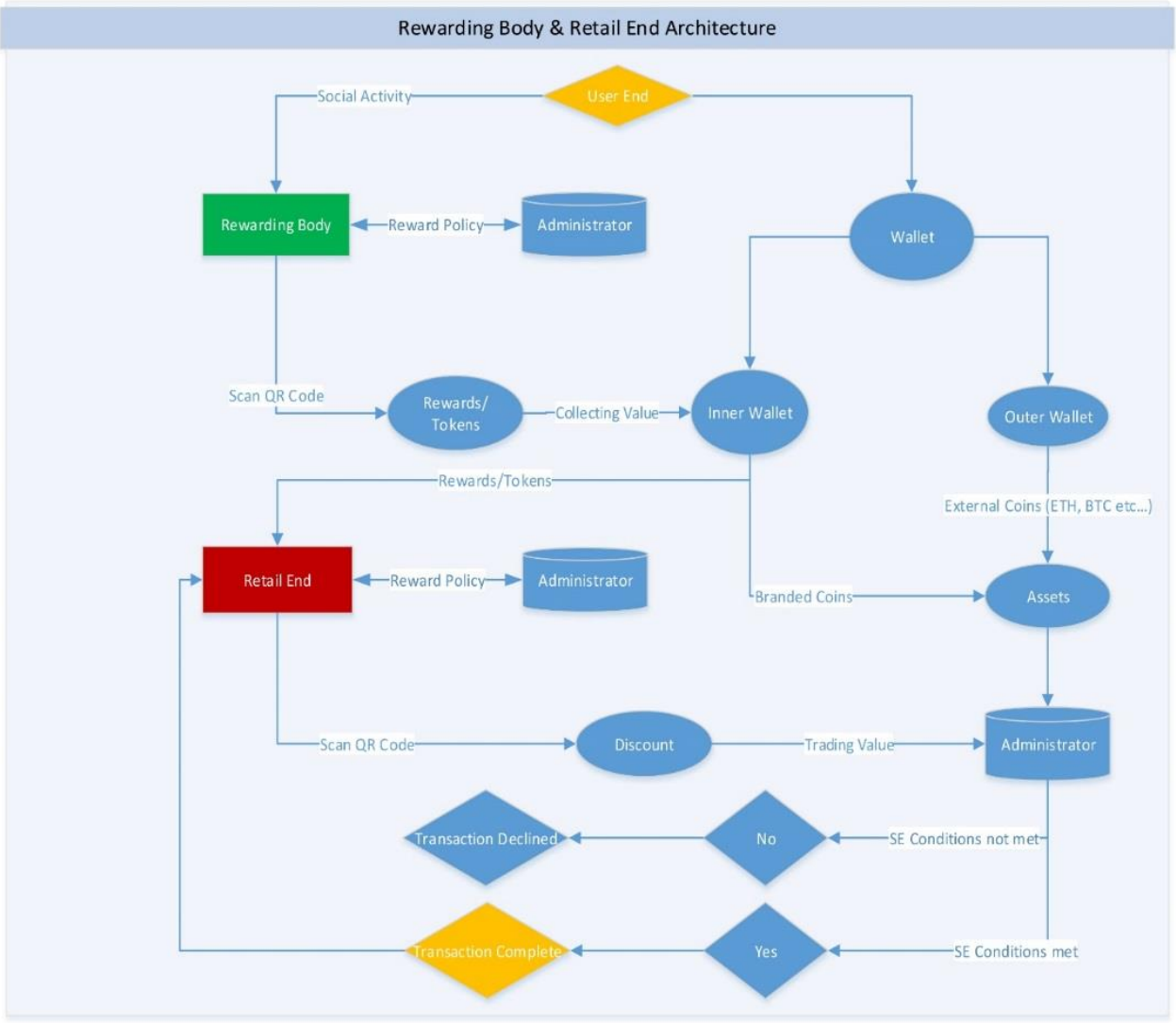
- S/E determines the size of the social rewards, benefits and discounts, according to the set rewards policy. For instance, customers with P/V equal to or higher than 10 are rewarded with 5% discount when buying coffee, users with P/V higher than 15 with 10% discount and so on.

- Certain retailers will agree on accepting Seratio tokens eg. Muslim coins can be used to pay 5% of the order at a halal butchery. In this case, amount of Muslim coins equal to the 5% of the order should be deducted from the customer balance.

4.4 Value Map & AI Wallet

Value map tracks social value created by the functioning in the area entities (whether Retail, NGOs, organisations, service providers, suppliers, etc) and by that allows Retail management opt for the entities with the similar values / policies. AI Wallet is another powerful CRM tool offered by the Seratio Retail End, that can help in getting to know the customer better.

4.5 Future Services



At the later stages of development, Seratio Retail End will provide a number of add-on CRM services (in addition to the Mapping & AI Wallet): Modelling, Forecasting, Visualisation, Reporting. Decisions produced by the aforementioned add-on services are based on the S/E values assessment.

5. ICO

The Seratio infrastructure ICO will allow Clients to invest directly in building the platform infrastructure (for example the Provenance Monitoring Tool), Reward mechanisms, etc and get Seratio Tokens in return. Community Token ICOs will be carried for every Token separately and will last for a Client specified time … 14-28-42 days. Both types of ICOs (Platform infrastructure and Community Tokens) suggest Seratio platform supporters will receive Seratio Coins in return for their contributions. Raised funds will go to the development and maintenance of the Seratio platform infrastructure services and communities.

Seratio coins will be offered in many ways, including but not restricted to the following:

- From Fiat to Token (e.g. from USD to Carers Coin)
- From Token1 to Token2 (e.g. BTC to Muslim Coin)
- From Fiat to Share
- From Token to Share

Coin selling for other on-the-market cryptocurrencies (maintained by the ShapeShift automatic exchange) will be completely automated and implemented through a smart contract. Coin selling for fiat and shares is partially regulated. It is our intention for the coins issuance to transparently happen by means of deployed smart contracts. Additionally authorized trusted entities (for example, banks) will continuously supervise the process to guarantee its smooth and transparent operation.

For example, to obtain Carers Coins through the ICO and depending on the ICO day the investment happened, the corresponding amount of coins will be issued to that investor for each ETH invested. The smart contracts code for the ICOs will be audited by credible third parties and will be publicly available.

Day	ETH	USD	Carers Coin
1	1	17	100
4	1	17	80
8	1	17	50
12	1	17	20
16	1	17	10
20	1	17	5
24	1	17	1

(Ap. ETH to USD exchange rate in the table is for 9.03.2017)

6. Coin Exchange

Seratio Community Coins are the family of Assured Branded coins. These are the coins that will be offered during the Community Token ICOs. For example, Muslims will have the opportunity to get a Muslim Coin, Retailers Coin, Carers or Mencap Coin. These will be more likely to be exchanged with those who share the same values eg. SDG's family of coins.

As the ICOs are controlled by Seratio, The initial token prices are guaranteed. Seratio also backs the tokens by means of a treasury deposit, market analysis and placing strategic orders once the tokens start being listed on exchanges. To further assure market sentiment & demand, the Client can also restrict exchanging / selling Seratio Coins bought or minted in the first few (specified for each token) months. Major Cryptocurrency exchanges (e.g., Poloniex, Bitfinex, Coinbase) are invited to list Seratio infrastructure and community issued tokens.

7. Summary Reflection

This paper establishes the architectural design and working features of the Seratio Enterprise Blockchain Platform. The open source philosophy and learning model enables fast integration and implementation of ideas across all stakeholders within the community. The integration of tangible and intangible records are unique and open up the possibility to new ways of treating and controlling impact investment, and humanitarian projects and ambitions, through the Sustainable Development Goals and beyond.

The three distinct work streams are bespoke yet complimentary. Each serve a different sector or market based on a common infrastructure and set of guiding principles. Each will therefore benefit from the participation, learning and design of the others whilst making a contributing to the overall brand, positioning and building of trust within the blockchain eco-system.

And finally, to introduce a concept that will be explored further in future whitepapers: Microshares[11]. A capability for stakeholders to become Microshareholders in any entity. Engagement, special rights, voting, privileges are among the positively impacted dimensions for an improved governance model that benefits minorities. The microshare holding system recently became possible to be achieved due to the advent of blockchain smart contracts programing. This has the potential to fully extend the benefits of shareholding to all stakeholders. This is a particularly important feature when engaging communities to achieve optimal impact investment.

[11] Alan Longley, Report of First Global Conference on Micro Enterprises, World Association for Small and Medium Enterprises, New Delhi India, 2000.

8. Background Note

Information on the open source Social Earnings Ratio® (Creative Commons, 2011) may be found at the not-for-profit Think Tank, Centre for Citizenship, Enterprise and Governance (www.cceg.org.uk) which focuses on Movement of Value. CCEG has received over 100 commissions, shown at www.socialearningsratio.com and operates 10+ SaaS platforms through the trading arm Seratio Limited (www.seratio.com). CCEG has over 60,000 members including 7,000 heads of CSR of the world's largest companies and 2000 politicians. Members receive the journal Social Value & Intangibles Review https://issuu.com/seratio. CCEG has founded the IoV Blockchain Alliance for Good (Bisgit.IoV) at www.bisgit.org, as well as the CCEG Blockchain UN Lab.

8.1 Whitepaper Schedule

Updates are available at:

https://github.com/seratio/whitepaper

1.0 Currency of Intangible Non-Financial Value (October 2016)
2.0 Values Based Impact Interventions (December 2016)
3.0 Impacting With Value: Capture-Translate-Transact-Report (February 2017)
4.0 Seratio Platform Architecture (March 2017)
5.0 The Blockchain Educational Passport (May 2017)
6.0 Transference of Value across Scale
7.0 Zero Sum Gain Acknowledgement of Value – where value is not transacted, lost or gained
8.0 Niche Applications (Ethical Leadership, Mental Health, Health & Wellbeing, Eternal Value, Brand Value, Provenance, Capacity Development, etc)

8.2 Contact

Centre for Citizenship, Enterprise and Governance
Bureau 112 UN Innovation, Green St, Northampton, NN1 1SY, UK
info@cceg.org.uk Tel: +44 1604 550100