

Traxia

USING BLOCKCHAIN TO DISRUPT TRADE FINANCE
V2

Traxia Foundation
Baarerstrasse 82, Zug, 6302, Switzerland
foundation@traxia.co

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ABSTRACT

There are over \$43 trillion of invoices sitting in companies' balance sheets waiting to be paid. The Traxia ecosystem allows those short-term assets to be digitized, tokenized and ultimately to be tradeable in a decentralized market. Traxia envisions a system where Sellers upload their invoice, Buyers approve it with their private keys, Issuing Providers write it into a smart contract, Liquidity Providers distribute cash liquidity, Listing providers manage the marketplace and Investors trade the newly created digital assets. Think of it as factoring on a blockchain. We have built a real use case using Liquease Ltd as our Listing provider, Porsche as the Buyer, mediaman and Vok Damns as the Seller and a corporate investor as the Liquidity Provider. Although, the Ethereum blockchain has been used in this first case to issue the smart contract, Traxia intends to build upon the Cardano blockchain. Traxia and LiqEase are the first investment of Cardano through their investment arm Emurgo.

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Background

On any given day around the world there are around \$43 trillion of accounts receivable or accounts payable on the books of businesses, of which, banks only finance around \$3 trillion of the total (Kemper, 2016). On a more granular level, there is a gap in global trade finance of around \$1.6 trillion, most arising from Asian companies (Asian Development Bank, 2016). The International Chamber of Commerce refers to trade financing as the 'oil' in the engine of international commerce and highlights the unmet demand for such financing (International Chamber of Commerce, 2017).

This gap is a result of a misalignment in terms of the demand for trade related credit and the liquidity of funds provided. It is disproportionately available to multinationals and large corporates – the top end of the market – and consistently absent in the SME segment (International Chamber of Commerce, 2017). Simply said, SMEs are faced with little choice but to accept their large customer's payment terms, no matter how onerous they may be.

Financial Technology (FinTech) companies have come up with solutions to this gap in global trade finance. However, in the absence of new instruments and marketplaces that connect and bring together different trade actors, new ventures have been unable to make a major difference, yet.

The current trade finance gap is due to the following major issues (International Monetary Fund, 2016):

- 1. Absence of trust and cooperation between banks**
A continuous decline in correspondent banking relationships has led to an economic fragility that has not been compensated by the limited growth in open account financing or Letters of Credit (L/C).
- 2. Limited transparency due to a lack of reliable data points along the trade finance value chain**
In periods shaped by a lack of trust and transparency, trade finance actors (private banks, export credit agencies, and regional development banks) seem to pool their resources (World Trade Organization, 2008) which creates difficulties in terms of obtaining comprehensive and reliable data on those trade finance transactions.
- 3. Limited Cash Liquidity in the markets and higher spreads**
Large banks have been reporting on several occasions that the lack of access to competitive funding has made them to drop out of several finance trade operations.
- 4. Bureaucracy and endless paperwork**
Digitalisation in trade finance is far from being mainstream. Providers have been promising digital letters of credit and bills of lading for years,

yet most corporates and banks still routinely exchange paper documents (International Chamber of Commerce, 2017)

SMEs account for more than one-half of the world's GDP and employ two-thirds of the global workforce (World Economic Forum, 2015). The number one barrier to growth faced by SMEs around the globe is access to financing (International Labour Office, 2015). This is not a new issue and the 2008 financial crisis only worsened the problem. Many local retail banks, who are often the primary and only providers of SME financing, have lost their appetite for taking on higher-risk SME loans. It is estimated that SMEs faced in 2015 a \$2 trillion USD global credit gap (World Economic Forum, 2015).

What is Trade Finance?

Global and local banks support international trade through a wide range of products that help their customers manage their international payments and associated risks, and provide needed working capital. The term "trade finance" is generally reserved for bank products that are specifically linked to underlying international trade transactions (exports or imports). As such, a working capital loan not specifically tied to trade is generally not included in this definition. Trade finance products typically carry short-term maturities which reflect the typical shipping times and payment terms of 30, 60 or 90 days or more. (Bank for International Settlement, 2014).

Actors

For the purpose of this whitepaper, we will solely focus on the actors of the 'financial supply chain'. Financial intermediaries, in a broader sense, offer services that allows an easier, faster, and cheaper execution of financial contracts between originators and acceptors.

This comprises the gathering, for example via brokers, rating agencies, or stock markets, of information to inform investors about borrower quality and/or risk. In general, disintermediation in trade denotes the omission of actors within a supply chain, as e.g. intermediary distributors or retail sellers. But, disintermediation in financing is the substitution of the traditional bank intermediation by the means of alternative forms of intermediation with regards to liquidity between investors and parties seeking capital.

Objects

Objects of finance include fixed assets, i.e. those assets that permanently provide a basis for the business operations, and working capital, which is variable on a day-to-day basis.

Production facilities, which provide the underlying logistic networks, as well as the equipment needed for customs clearance and the transport within the network are considered fixed assets within a supply chain. The term working capital comprises all current assets transformable into liquid assets within one production cycle or at least within one year. Circulating assets minus the short-term liabilities are called net working capital. A key figure which, in this context, is suited for an examination of the cash flow is the cash-to-cash-cycle. The latter is calculated as follows:

$$\text{Cash-to-cash-cycle} = \text{average turnover period} + \text{period of receivables} - \text{period of payables}$$

The cash-to-cash-cycle is the period of time needed for a company to transform the cash drain resulting from paying the suppliers into cash inflow from customers again. The cash-to-cash-cycle thus is a key figure to a dynamic and holistic treatment of the net working capital performance both within the company and within the supply chain.

Terms

Supply chain finance has three dimensions: 1. The amount of assets to be financed (volume of financing), 2. The duration of the financing and 3., the capital cost rate (financing cost). Multiplying these three factors together gives the total capital cost that a company has to generate at least for an investment to be profitable:

$$\text{Capital costs} = \text{Volume} * \text{duration time} * \text{capital cost rate}$$

The most important starting point for the optimization of the financing within a supply chain beyond classical logistics measures is thus the capital cost rate.

Traditional Trade Finance Products

Many SMEs find it difficult to finance their production cycle, as most buyers demand around 60 days to pay for goods from the date of delivery. In any transaction, a seller will issue an invoice, which they account for as an account receivable. The buyer then accounts for the invoice in their accounts payable. Accounts receivables are illiquid assets until payment is received.

Factoring

Factoring is a type of supplier financing, in which firms sell their credit-worthy accounts receivables at a discount (generally equal to interest rates plus service fees) and receive immediate cash. Factoring is not a loan and there are no additional liabilities on the firm's balance sheet, although it provides working capital financing. In addition, factoring is often done "without recourse", meaning that the factor purchasing the receivables assumes the credit risk for the buyer's ability to pay. Factoring is a comprehensive financial service that includes credit protection, accounts receivable bookkeeping, collection services and financing.

Letter of Credit

One of the most common and standardized forms of bank-intermediated trade finance is a letter of credit (L/C). L/Cs reduce payment risk by providing a framework under which a bank makes (or guarantees) the payment to an exporter on behalf of an importer once delivery of goods is confirmed through the presentation of the appropriate documents.

For the most part, L/Cs represent off-balance sheet commitments, though they may at times be associated with an extension of credit. This can occur, for example, if an import L/C is structured to allow the importer a period of time (known as “usance”) before repaying the bank for the payment it made on the importer’s behalf. Banks may also help meet working capital needs by providing trade finance loans to exporters or importers. In this case, the loan documentation is linked either to an L/C or to other forms of documentation related to the underlying trade transaction.

Supply Chain Finance (SCF)

To avoid confusion, it should be mentioned that supply chain finance is only a subset of trade finance and has been defined by the International Chamber of Commerce (ICC) as ‘the use of financing and risk mitigation practices and techniques to optimize the management of the working capital and liquidity invested in supply chain processes and transactions. [Supply chain finance] is typically applied to open account trade and is triggered by supply chain events. Visibility of underlying trade flows by the finance provider(s) is a necessary component of such financing arrangements which can be enabled by a technology platform.’

Reverse factoring is the most widely used form of financing under this category (PwC, 2017). In contrast to traditional factoring as described above, reverse factoring is initiated by the buyer and not by the seller. The ‘factor’ is a financial intermediary and in more detail the entity that is providing short-term cash liquidity. The factor acts on its own economic risk and advances a payment to the supplier and then, at the invoice payment due date, a transaction from the buyer to the factor is initiated.

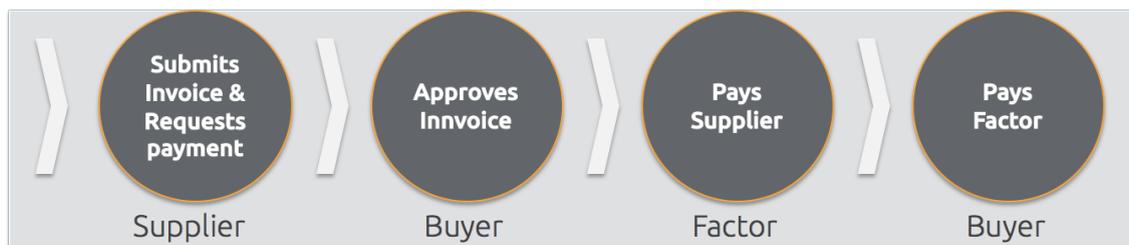


Figure 1 – The reverse factoring process

According to the paper 'A study of the business case for supply chain finance published by the Association of Chartered Certified Accountants in June 2014, the advantages of a Reverse Factoring Program for Buyers are mainly that costs are reduced across the supply chain. This is due to letting suppliers 'borrow' against their customers' creditworthiness instead of their own. On average, 80% of the resulting value is shared between the suppliers and the buyer, with varying degrees of allocation depending on whether the buyer wants to facilitate its key suppliers' financials (i.e. the largest share goes to supplier) or, instead, take all the benefits by extending payment terms. Typically, the buyer will capture 35% to 50% of all savings, while suppliers will get 25% to 45%. Another 15% goes to the financial intermediary while the remaining 5% is for the service provider.

Securitization

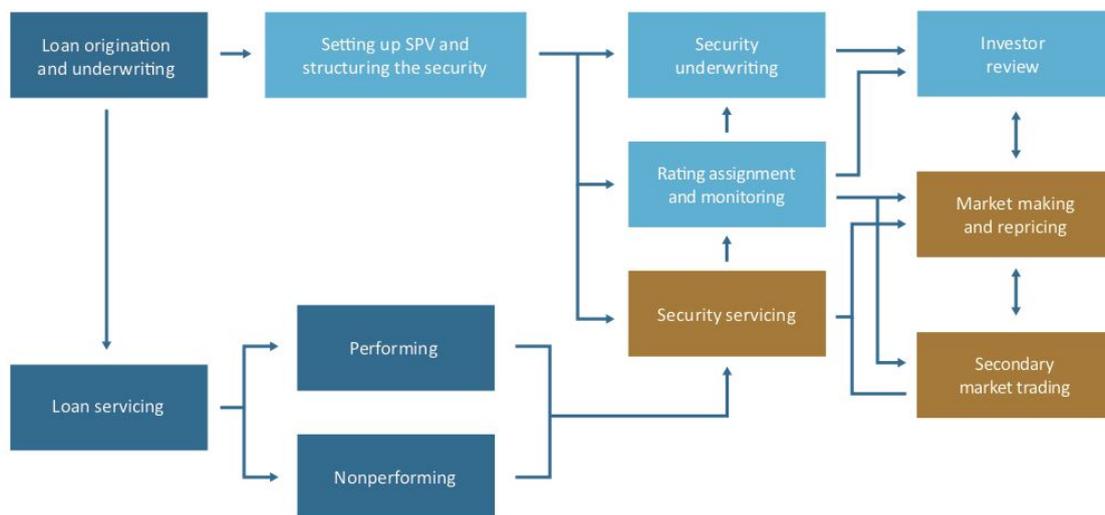


Figure 2 – a typical securitization process

Before discussing in detail on how blockchain may change the securitization lifecycle, a brief high-level review of securitization (Figure 2) may be helpful.

It begins with originating and underwriting² of loans, which are then serviced regularly, similar to traditional bank lending. An issuer or originator pools together many loans, places them in a bankruptcy-remote trust or special purpose vehicle (SPV), and structures the securities. An auditing firm reviews the pool and provides a pool audit letter and an agreed-upon procedures letter covering the pool statistics provided to investors. Rating agencies may be asked to express an opinion on the securities' credit-worthiness by providing a credit rating.

The underwriters' task is to raise investment capital. They work with a counsel and the transaction sponsor to prepare an offering document. The underwriters then price and bring the securities to market, where investors make purchases based on their risk-reward preferences.

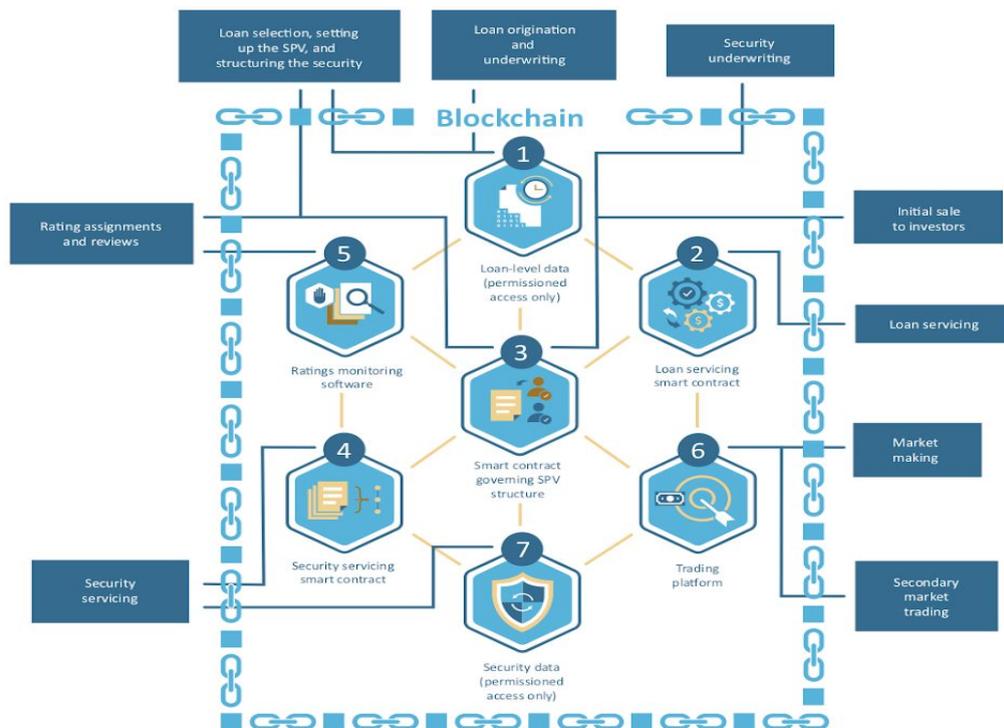
Trustees manage the trust entity and represent investor interests. A servicer collects borrower repayments, pools them, and forwards them to a trustee, who allocates distributions to security holders based on the payments waterfall defined in the transaction documents. Rating agencies monitor the securities' performance and update ratings if needed. In secondary markets, investors continue to review and reassess the securities based on performance. Broker-dealers make markets among investors trading the securities and establish new prices.

Securitization, due its current level of complexity and the participation of numerous intermediaries, is mostly used for larger trade deals that range in the millions of US Dollars. Shortcomings of the current setup and efficiency gaps in the securitization value chain are: non standardized processes and dependencies on central clearing houses and custodians.

In this context, blockchain can have a large impact in transforming and enhancing securitization.

Market Opportunity for a blockchain powered solution

Opportunities for blockchain solutions in the trade finance securitization process are summarized by Deloitte in the flow below. This is the platform that Traxia will create (Deloitte, 2017):



Source: Deloitte Development LLC, 2017.

Figure 3: Blockchain and Securitization - a possible look at the future

Step 1: As a borrower and lender agree to the terms of a loan, a new electronic asset is created on the blockchain and time-stamped. Ownership information and other pertinent underwriting data, such as supporting documents or Credit scores, are attached to the loan and recorded on the blockchain. This information cannot be altered without a new consensus between the borrower and loan owner.

Step 2: Relevant information about the loan is automatically coded into a smart contract which governs the automated servicing of the loan. As the borrower makes or fails to make payments, this history is added to the loan-level data and supports future servicing decisions, such as the possible need to engage a default servicer if the borrower does not pay. Ownership rights of the asset are also automatically immutably recorded and timestamped.

Step 3: The sponsor/issuer pools together loans and transfers them to an SPV, which records the transfer and the related loans on the blockchain. The 'automatable' portion of the transaction's terms, including its cash-flow model, are written in a series of smart contracts, which the sponsor/issuer, underwriter, rating agencies, trustees, and other relevant third parties verify and agree to.

This consensus creates a single governing model for the transaction.

Rating agencies, investors, and other relevant stakeholders reference this model and, if desired, also the underlying loan-level data to perform their assessment of the newly-created securities. In addition, relevant portions of the offering and legal documents are also automatically created with smart contracts. Regulatory compliance is largely automated, as smart contracts are programmed to immediately note any potential irregularities.

Step 4: A separate smart contract to service the securities is layered on top of the SPV and the smart contract developed for the transaction itself. This new contract collects payments from loan servicers, references the cash-flow model specified in the contract governing the SPV, and distributes payments to the beneficiary holders of the security with only minimal delays for settlement. This information stream is related to rating agencies and the secondary markets.

Step 5: Ratings monitoring software sometime referred to as 'Oracles' are placed on the blockchain to match the security performance with expected cash flows and trigger rating reviews when discrepancies arise.

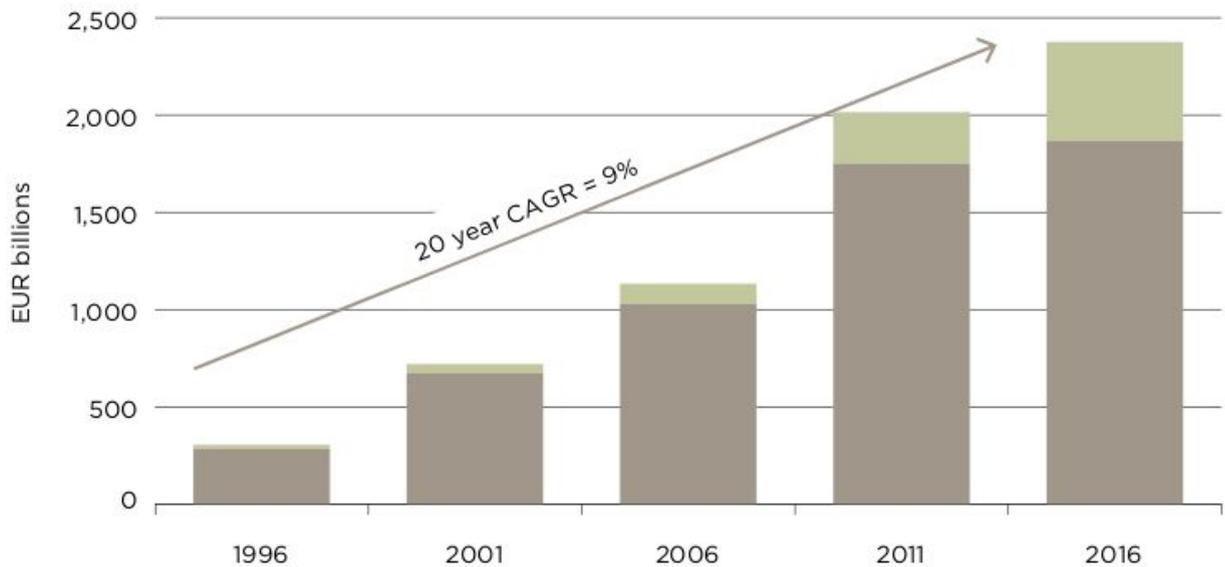
Step 6: Trading or market information platforms are constructed with blockchain technology to interoperate with the blockchains used for the transactions and enable market makers to create robust secondary markets in securitized assets. With the help of market makers, securities trading on the blockchain is near-instant and low cost, with regulatory compliance close to automatic, as data on asset ownership is reported in real-time to regulators while it remains hidden from competitors. Large investors could potentially directly trade on these platforms without having to go through broker-dealers.

Step 7: As the securities are created and traded, beneficiary information is stored and updated in a separate repository, which acts as a custodial entity. This updated beneficiary information is referenced to facilitate future security servicing. To maintain confidentiality, only relevant trustees and regulators possess full access to this information. Less sensitive data such as ratings or underlying payments information could be made available to other actors.

The growth of Factoring

Commercial, non-bank factoring enterprises are playing a large role in the US, UK, and China, and with the rise of FinTechs, non-bank players will have an increasingly significant impact on the industry. The explosive growth of the industry, especially since the start of the financial crisis, is in large part inspired by an improved perception of risk globally, but also stemming from a shift from overdraft/unsecured credit facilities to receivables-based financing (International Chamber of Commerce, 2017).

Combined growth of national and international factoring:



Total factoring volume from 2010 to 2016:

								VARIATION	
	2010	2011	2012	2013	2014	2015	2016	2015/2016	CAGR
World Domestic Factoring	1,402,331	1,750,899	1,779,785	1,827,680	1,857,410	1,838,366	1,868,855	1.66%	4.90%
World International Factoring	245,898	264,108	352,446	402,798	490,114	529,379	507,112	-4.21%	12.82%
World Total	1,648,229	2,015,007	2,132,231	2,230,477	2,347,524	2,367,745	2,375,967	0.35%	6.28%

Those trends allow Liqease and Traxia to tap into a massive market with huge growth potential which is supported by increasingly favorable macroeconomic data and validated by startups operating in similar segments.

Traxia's solution: a decentralized trade finance ecosystem

The vision of Traxia is to establish an open and decentralized ecosystem to improve trade finance globally. Traxia combines blockchain and an open, connected IT architecture to create a new ecosystem for trade finance. It allows corporates to create smart contracts — automated, self-executing digital contracts that trigger payments and receipts in real time as goods move through the supply chain.

Tracking of goods through modern Internet of Things (IoT) solutions can further eliminate uncertainty about where physical goods are; blockchain helps to verify identity and ownership and could conceivably simplify compliance and governance, as well as reducing manual work and human error. The transparency gain from such advancements ultimately leads to better access to finance in several ways:

1. Trust and Transparency - an inherent feature of blockchain technology, further enhanced with smart contracts

Recording and confirming a trade on the Traxia blockchain will create higher levels of trust in B2B trades. A Seller and Buyer are asked to sign such trade transaction using their private keys to record and create an immutable entry on a blockchain. The technology makes it seamless to assign privileges to data entries in accordance to the role of each participant such as: Trading Businesses, Investors, Regulators, Logistic Providers etc. therefore combining data ownership with a new level of transparency as needed. Use cases around IoT and business process automation will be the focus of our next phase. Such use cases have the potential to further increase supply chain transparency.

2. Securitization and Standardization – the initial Traxia focus, with LiqEase developing the use case

Securitization can be attractive to both bank and non-bank investors. For banks, securitization allows them to economize on capital and/or liquidity and reduce US dollar funding needs, while preserving a return on firms' expertise/comparative advantage in originating and managing trade finance loans. Distribution to outside investors can also free up counterparty space on balance sheets and reduce trade loan concentrations.

For non-bank investors, direct or indirect investment in trade finance assets offers a potentially attractive return relative to risk. We will introduce how Traxia will use blockchain technology to streamline the securitization process below. Standardization ranks among the Top 3 challenges of having more institutional investors entering export finance (International Chamber of Commerce, 2016). The Traxia Ecosystem will provide standardized processes and products to make the issuance of a Smart Contract backed by trade more seamless with the support of our technology provider LiqEase Limited.

3. Access to capital markets through decentralization

Traxia will decentralizes trade finance technology and will work closely with international regulators to make such an open market possible. The largest global banks account for a quarter to a third of the global supply of bank-intermediated trade finance, with local and regional banks providing the remainder (International Chamber of Commerce, 2017). Such centralization comes with the disadvantage of dedicated market knowledge that favours local and regional banks. Those banks on the other hand face the disadvantage of L/Cs being 80% denominated in US Dollars which makes refinancing in US Dollars a hurdle and major obstacle for those banks (Bank for International Settlement, 2014). In result, 61% of banks perceive that there is more demand than supply for trade finance (International Chamber of Commerce, 2017). Decentralization has the potential to stabilize the trade finance markets. New

entrants such as fixed income funds can get access to a standardized trade finance product similar to a corporate bond. Such a digital platform can also provide credit risk insurers with an additional channel to sell their products directly to SMEs.

Our proposed model for optimizing financial flows in supply chains, turns the actors within the supply chain into intermediaries who can overcome the problem of asymmetric information between capital markets (e.g. banks) and the parties seeking capital.

The Smart Contract

Traxia creates a new trade finance platform that operates through smart contracts running on a blockchain. Those smart contracts hold information such as volume and duration of an underlying trade, while also becoming interoperable with existing Enterprise Resource Planning (ERP) Systems, Payment Networks such as SWIFT, [Ripple Settlement System] and others. Traxia is also a tool to model and automate business processes to save time, costs and generate a higher efficiency for corporates along their respective supply chains.

As argued by Hans-Christian Pfohl and Moritz Gomm in their paper 'Supply chain finance: optimizing financial flows in supply chains', the proposed model for financing the supply chain, turns the actors within the supply chain into intermediaries who can overcome the problem of asymmetric information mentioned above.

Traxia will take their scientific model that has been proven successfully using a qualitative approach, as our underlying assumption to improve cash allocation into trade-related financial products. In a nutshell, their model assumes that the information asymmetry between actors within the supply chain and financial institutions providing cash liquidity can be solved by making the supply chain actors part of the financial supply chain. We therefore make the B2B trade intermediaries (Buyers, Sellers) part of the financial supply chain by letting them issue the trade related smart contracts using our technology. We therefore propose the following Actors to be part of the Traxia Blockchain Ecosystem for Trade Finance. Besides the Traxia itself, we have companies engaging in a B2B trade which we call Sellers and Buyers, as well as Investors, Issuing Providers, Listing Providers and a facility to warehouse loans which will be initially provided by a leading Chinese financial institution and we are aiming to onboard further providers globally.

The Actors

1. Seller

A company that is offering a product for sale. In our ecosystem, it also represents the party that is looking to improve its cash liquidity and, solely or jointly with the Buyer, looking to issue a smart contract representing a trade obligation. In the Traxia ecosystem, these are often SMEs.

2. Buyer

A company that is purchasing the product. In the Traxia ecosystem, the Buyer is often a larger corporation which generally has a better credit rating than an SME Seller. Better ratings can be used to mitigate the risk for the Investors if the smart contract representing the trade obligation is jointly issued, which is similar to the reverse factoring model. In short, a large company like Porsche, is more than likely to pay than a smaller company and that ability to pay can help the credit rating of the contract.

3. Investors

A person or organization that puts money into financial products, assets, etc. with the expectation of achieving a profit.

4. Issuing Provider

Due to the novelty of putting trade-finance on a blockchain, Traxia came up with the concept and role of the 'Issuing Provider,' which is the technology provider that setups and maintains the Traxia platform.

The issuing provider creates a platform to streamline the process of uploading and validating business and trade details by combining commonly used web technologies with a modern blockchain infrastructure running on the backend in a manner that is transparent to the Buyer, Seller or Investor. The only exposure that the actor would have to the blockchain is the need to sign a transaction with an individual private key/passphrase that has been assigned to the user.

The issuing provider will be responsible for the technical integration of rating agencies and data providers e.g. accessing directly via Oracles or more traditional via API interfaces as well as provide access to licensed payment gateways to make settlement of fiat currencies possible between actors.

To sum it up, the Issuing Provider:

- Sets up and maintains the technical infrastructure to gather information relevant for issuing the smart contract on behalf of the Buyer and/or Seller representing a B2B trade and including information such as 'Contract Volume', 'Contract Currency', 'Contract Duration' etc..
- Implement standards to guide Buyers and Sellers through a due diligence process including KYC and AML checks based on Business Certificates, staff Passports, Financial Statements, audits, letters of good standing etc.
- Take necessary technical precautions in terms of data safety and
- Implement the public key, asymmetric encryption method to let Buyers and Sellers digitally sign their smart contract and digital asset issuing transactions

5. Listing Providers

A Listing Provider is a marketplace that matches investors of securities with listed and unlisted securities. A listed security is a financial instrument that is traded through an exchange. Exchanges have listing requirements to ensure

that only high-quality securities are traded on them to maintain the exchange's reputation among investors.

Although there is increased scrutiny of regulators regarding cryptocurrencies and increased targeting of fraudulent ICO business practices, there is in no jurisdiction that has a dedicated set of rules and laws in place to categorize a digital asset and/or blockchain token. Also considering that accounts receivables are in fact categorized as current assets under international bookkeeping standards, it seems unlikely to see a new set of rules approaching that will transform accounts receivables into a security, as traditional factoring services have been in operation for many years. In some markets, like the US, UK and Brazil, factoring is unregulated, giving commercial factors an advantage over their bank counterparts in the traditional factoring field.

6. Loan Warehousing

Loan Warehousing is the initial process of acquiring debt from various sources, as an example, a bank or similar institution providing funds to a borrower without using the bank's own capital. In the Traxia ecosystem, debts that arise from B2B trade transactions that do not "find" an immediate Liquidity Provider are warehoused. Our technology provider LiqEase managed to acquire a strategic partner (a leading Chinese financial institution) to do exactly that especially for China but also abroad.

The team around Traxia therefore successfully managed to close the assumed bottleneck for the ecosystem and showcased that the team is able to deliver and execute. Traxia will further be working with Creditsafe,¹ a rating agency whose scores are recognized by major Credit Insurers such as Euler Hermes and Coface.

7. Risk management and 3rd party data providers

Data providers such as <https://www.cynopsis-solutions.com> are integrated via APIs and allow us to conduct Know-Your-Customer and Anti-Money Laundering checks. Providers such as <https://www.creditsafe.com/> are connected to the platform to validate information provided by the businesses that register and want to access finance through the Traxia Ecosystem. The credit scores that are provided by Creditsafe are accepted by large credit insurance companies such as Euler Hermes (<http://www.eulerhermes.com/Pages/default.aspx>) and Coface (<http://www.coface.com/>). Allowing only 'high score' companies to access finance through our ecosystem can therefore always be combined with a trade insurance that is covering up to 100% of the trade and therefore reducing the risk significantly for professional investors investing in those assets through our platform. We are in touch and discussions with further data providers such as Zhima Credit (Ant Financial) in China and the partner we acquired for Loan Warehousing also has its own database to better evaluate local businesses and their ability to pay. In essence the focus is on high quality assets only to begin with. This approach is combined with 2 party verification of the trade and both Buyer and Seller have to confirm such. Scoring through 3rd

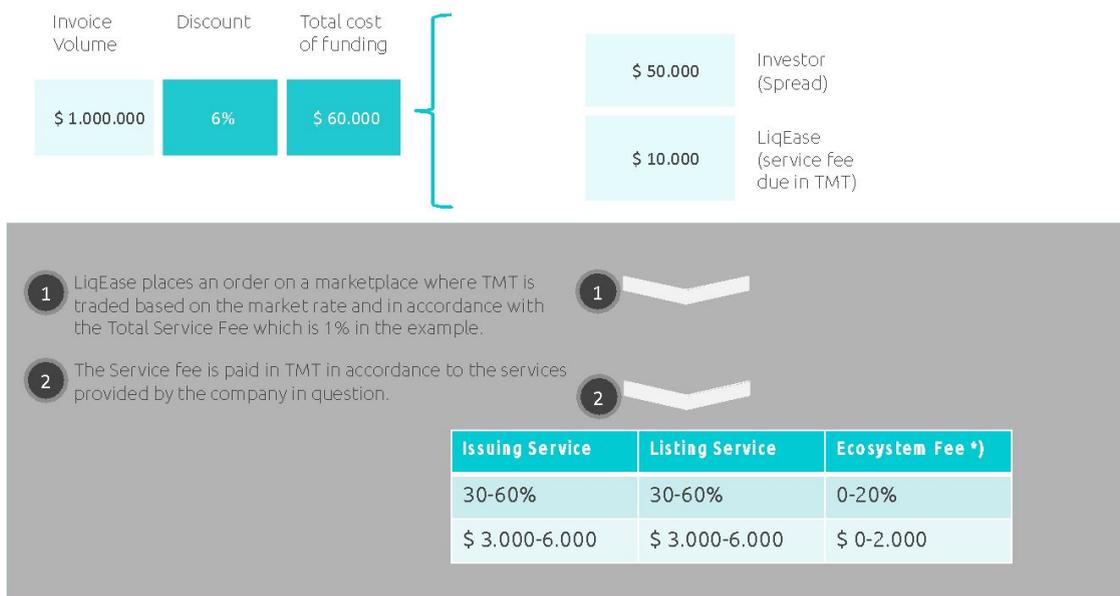
¹ www.creditsafe.com

party data providers as well as insuring the trade are a further addition to reduce the risk for institutional investors investing through our platform.

Tokenized access to the Traxia platform

Our membership model is straightforward and involves two types of access a) accessing the ecosystem through Issuing and Listing services and b) membership fee on a per transaction basis to be settled in Traxia Membership Token (TMT) at the conversion rate of when the Issuing and Listing services have been provided.

The following diagram illustrates the business model:



As illustrated in the graphic above, the technology provider LiqEase is providing the services of Listing and Issuing to interested Buyers and Sellers to access the ecosystem. LiqEase can be compared to the Ethereum Switzerland GmbH which is associated to the Ethereum Foundation and is entitled to use the funds of the Crowdsale according to the statute of the Foundation. For establishing the basis of the Traxia Ecosystem, LiqEase as well as Traxia are therefore entitled to a share of the overall proceeds as illustrated above. Whereas Issuing and Listing Fees is allocated to LiqEase and Ecosystem fee to Traxia.

What we already built

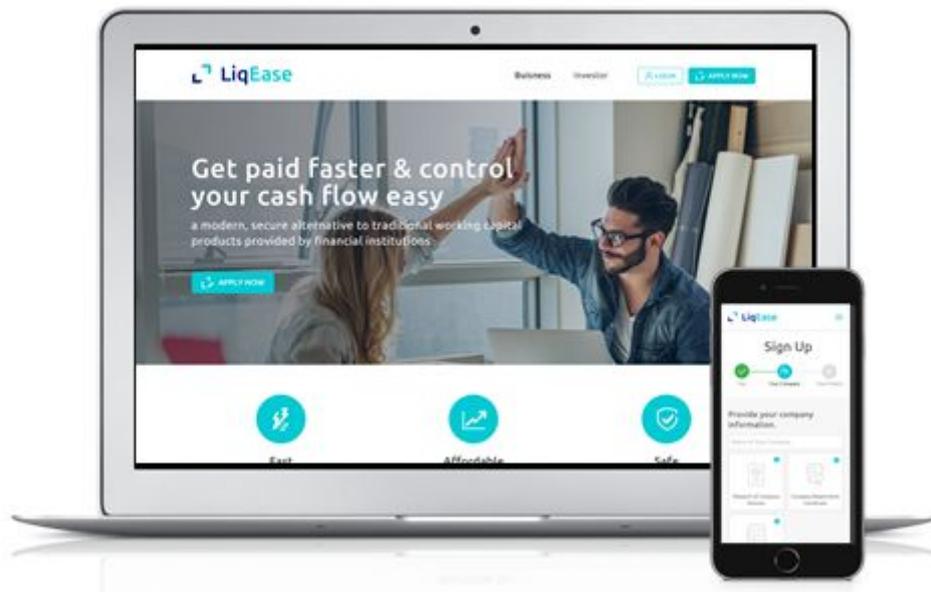


Figure 4: LiqEase home page

Award winning LiqEase² is a Limited company registered in Hong Kong since 2017 and borne out of a project that begun in 2016. LiqEase is the technology provider within the Traxia ecosystem providing Issuing and Listing Services to Buyers, Sellers and Investors.

LiqEase has thus far built a simple and user-friendly Web-Interface that can be used today by Buyers and Sellers to upload their invoice. In the backend LiqEase is running a blockchain application layer for various blockchains such as Ethereum and will build upon Cardano when ready. LiqEase Limited operates as a Listing provider i.e. running an Over-The-Counter market which targets professional investors as defined by the regulators in Hong Kong [15]. You can find out more about LiqEase at <http://liqease.co>

²² Liqease was the winner of SLUSH Shanghai 2017
(<http://www.slush.org/news/liqease-to-win-the-slush-shanghai-pitch-competition/>)

The workflow of the current product built by LiqEase is as follows:

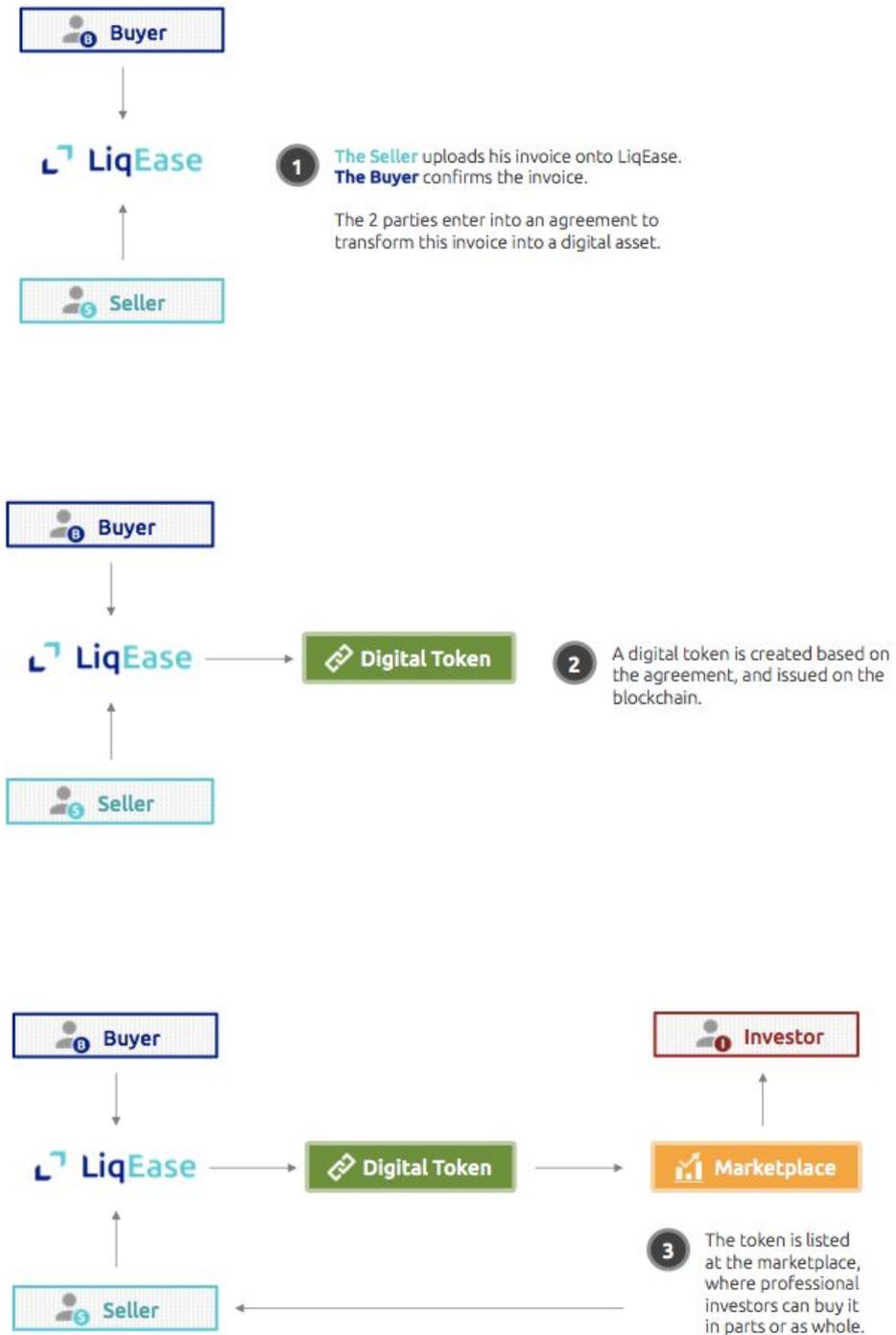




Figure 5: a simplified version of LiqEase process (to see a video of the process visit: <https://goo.gl/jNHuna>)

As the assets created on the platform are merely a digital representation of a real trade asset issued by the Buyers/Sellers, there is no need for an International Security Identification Number (ISIN). In addition, there is no custodian as the digital version of the asset has already been digitally signed by the Supplier and/or Buyer with their respective private keys and recorded on a blockchain. As the blockchain is distributed, this adds an additional layer of trust as compared to a traditional central custodian safekeeping the asset. The asset is then listed on the marketplace instantly and settlement times can easily be reduced to minutes rather than days.

Initial Proof of Concept

In one of its first use cases, LiqEase was the Issuing Provider and Listing Provider for a Porsche Digital Innovation Project (the Buyer) who listed a 30 days invoice worth around \$ 50.000 in total. The Seller was VOK Dams and a 3rd party corporate investor was the Liquidity Provider. The smart contract was registered on the Proof Ethereum Blockchain under the transaction number: <http://www.proofsidedchain.com/#/transaction/0x7453e318039cc04c08cfb475ec62b2107bc9898361138de71eef32285a7b9475>.

LiqEase is currently working on another project involving another German car manufacturer, as well as on projects in the Fast-Moving Consumer Goods (FMCG) sector. LiqEase expects to work on a number of different financing projects during 2018. Focusing its activity on the multi-billion-dollar trade corridor between Europe and China.

Traxia and LiqEase

Traxia is a non-profit foundation being established under the laws of Switzerland. It is the creator and initiator of the blockchain model described in this paper. The Traxia foundation's mission is to promote and support the Traxia platform through development and education and provide buyers, sellers and investors around the world with a more accessible, transparent and more trustworthy system to engage in global trade.

The Traxia foundation will support projects like LiqEase and can invest in entities and projects that support the purpose of the foundation as stated.

LiqEase operates a for profit businesses and is building the gateways and applications to connect and be part of the Traxia ecosystem. LiqEase is an Issuing and Listing Provider and is in fact the first successful proof of concept of the Traxia ecosystem.

Coming back to our initial assumption, the Traxia platform creates more transparency within a supply chain by integrating smart contracts into business processes and is creating the basis for Buyers and Sellers in B2B trade to become active participants in supply chain finance, hence improving the information symmetry between the supply chain and capital markets. Higher information transparency between actors, increases the likelihood that financing can be provided for an asset that is issued by a Seller/Buyer.

The development of LiqEase increases the demand for the TMT and improvement of the Smart Contracts, creating higher levels of transparency within the supply chain powered by the Traxia Foundation.

Business Strategy

Our strategy focuses on creating a network effect as our decentralized trust and transparency ecosystem enables us to do so. We will use the well-known bowling pin strategy i.e. start with a niche market, and then move to other niches and broader markets.

Stage 1

Focusing on the supply side first: Traxia will work to accepted and used by sellers to finance their B2B trade. Establishing partnerships with distributors that have an existing relationship with those suppliers and a vetted interest in successfully financing such deal can enable instant scale.

To achieve that, we will partner with distributors, importers and exporters focusing on the FMCG market segment first in particular the trade corridor between Europe and China. We are already in positive talks with major players and working together with a team belonging to Intermarché which in 2016 had a turnover that surpassed €30bn USD.

To get a head start and accelerate growth, the Loan Warehousing Facility will provide a strategic advantage over competitors and makes it possible to streamline the process from the originating of the debt to the bundling and securitization aspect which is relevant for institutional investors to deploy their money efficiently.

The goal is to use the Warehousing as an entry strategy for different markets with large gaps in trade credit and traditionally low default rates. It will be replaced by independent banks and investors at a later stage to fully decentralize the market.

Stage 2

Educate the initial client base and foster word-of-mouth campaigns through the creation of a referral program.

Stage 3

Broader market adoption by targeting global investors such as hedge funds. The more Traxia is recognized as a reliable ecosystem, the easier it will be to expand globally. Education will again be key. Traxia will need to show investors how they can tap into a new market of standardized trade assets on the basis of immutable smart contracts that is only accessible through the Traxia Ecosystem and its partners.

Product Architecture and Development Roadmap

Concerning our product development, our roadmap looks as follows:

V1 (alpha) January 2018

V1 (beta) March 2018

Monolith API (PHP), web clients (Angular 4 / Typescript)

V2 April 2018

Monolith API (PHP), web clients (Angular 4 / Typescript)

V3 June / July 2018

Microservice API (NodeJS/Typescript/GraphQL), webclient

(ReactJS/Typescript/Redux), mobileclient (React Native/Typescript/Redux)

V1

In terms of architecture, we have three entities working together.

First, we build the core of the project around our first use case and initial focus to make the Traxia ecosystem viable i.e. our CMS, Liqease.com. This CMS has been developed using robust technologies such as (PHP, Typescript, Angular). The CMS has a monolith architecture API (PHP) and uses Angular 4/Typescript as client.

Second, we have a marketplace where professional investors can trade digital assets that are collateralized by invoices and other relevant contracts in relation to such a trade. This marketplace is powered using an open source projects (currently proofsuite and we are in close contact with their development team and CTO - Tai Kersten). We are also working with other open source projects for operating such a marketplace such as e.g. Lykke and are in touch with their Singapore team (Zheng Wei Quah and Alan Laubsch).

Third, the ecosystem will be powered by a membership/voucher Token (TMT) that remunerates and incentivizes the participants and technology providers within the ecosystem.

V2

Our second version will have a different approach, based on the latest client feedback as well as the product roadmap and the necessary flexibility within that roadmap. The key philosophy is to ease the process and make the platform as easy to use as possible for our users.

Traxia will also develop the next generation of the CMS and use a microservice API architecture (NodeJS/Typescript/GraphQL) that will be responsible to organise the different services and clients. Our platform clients will be web client (ReactJS/Typescript/Redux) and mobile client (React native/Typescript/Redux)

The second version of the product will be built on the Cardano Blockchain Infrastructure. The TMT Token will be made available on Cardano and we believe a more seamless integration between the Traxia Ecosystem requiring TMT to pay for the technical services provided by LiqEase.

V3

The third version will focus on the Smart Contracts and making them 'truly smart'. Our focus in V1 and V2 is to satisfy market demand and prove that a blockchain-based solution is viable for trade finance. Operating a stable and scalable product that solves the trade finance gap utilizing a blockchain for securitization of the underlying trade will give us the necessary fundamentals to evolve the product over time and integrate smart contracts into the enterprise systems and workflows.

Further details about the Technology and Smart Contracts can be found in the Annex.

Traxia Membership Token (TMT) Sale

To fund the initial operation and creation of the Traxia platform, we will be offering the sale of TMT tokens.

The supply of TMT is limited to a maximum of max. one billion (1,000,000,000) tokens in total, including those available for sale during the Token Sale. The tokens will be generated upon the token launch and will be distributed in the following manner:

70%

of the tokens will be eventually allocated amongst the community. Distributed in the following order 40% + 20% + 5% + 5%

20%

will be allocated to the foundation creation, development team, early backers.

10%

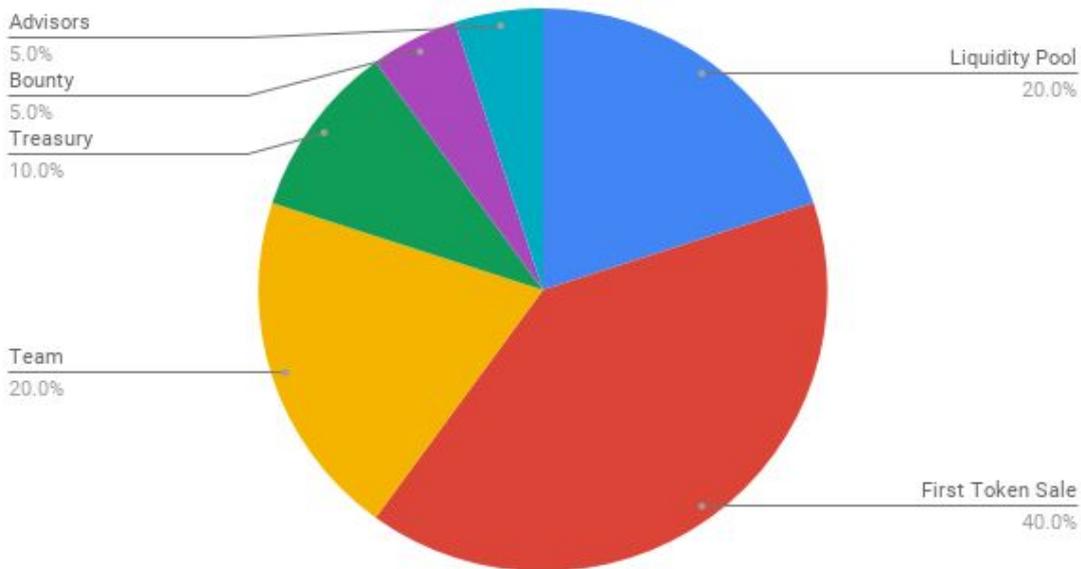
will be allocated to treasury with the purpose of providing TMT Liquidity if necessary as well as being a contingency fund.

The Traxia crowdsale and the corresponding token creation process will be organized around smart contracts running on the Ethereum blockchain. Participants willing to support the development of the Traxia project can do so by sending Ether (ETH) and ADA tokens to the designated address. By doing so, they are purchasing TMT at the rate of 1 TMT per US\$ 0.055 which will be sent to their ETH wallet after the sale. Any ADA and ETH that is send to the designated address will be converted to TMT at market rate of ETH, ADA to US\$ each day during the sale at 12.30 pm (UTC+8). ADA, ETH that has been transferred within the 24 hours previous to 12 pm (UTC+8) on each given day during the sale will be included in the daily conversion and TMT distributed to the ETH address that has been provided by the purchaser.

Allocation	Percentage	Distribution
400,000,000 First Token Sale	40%	TMT Token Pre-Sale (March 2018) and Token Sale in March-May 2018. Unsold TMT will be burned.
200,000,000 Liquidity Pool	20%	Additional Token Sale in 2-3 years' time.

100,000,000 Treasury	10%	Emergency Fund & Legal Fees - These will be subject to a 2-year lock-up.
50,000,000 Bounty Program	5%	Distributed to developers for backing the project over the first 2 years until projected profitability.
50,000,000 Advisors	5%	Advisor will be subject to 60% locked for 12 months; 40% locked for 24 months
200,000,000 Team Members, Early Backers and Investors	20%	Team member and Investors will be subject to 60% locked up for 12 months; 40% locked up for 24 months

TMT Token Distribution



Token Demand and Supply

The price for the TMT will be priced by markets and exchanges, identical to any other token. As our network and ecosystem grows — more Buyers and Sellers issuing their digital assets using the services from Issuing and Listing Providers in the ecosystem — the total amount of TMT remains fixed to max. 1,000,000,000 Tokens. Such an upper ceiling triggers traditional market dynamics, as soon as Buyers and Sellers issue smart contracts representing their B2B trade obligation, generating TMT demand since a membership is required to access the ecosystem.

Token Amounts and Discounts during Pre-Sale and Sale

The total amount of TMT Tokens sold in will be 400,000,000.00 in this first Token Sale. The price for the TMT will be reduced during the pre-Sale and early phases of the sale as follows:

Phase	Pre/Private-Sale	Sale (1 st round)	Sale (2 nd round)	Sale (3 rd round)	Total sale
TMT Max Amount	220,000,000	180,000,000	Dependin g on previous round ³	Dependin g on previous round	400,000,000
Discount	40%	20%	10%	0%	na
Max. USD	7,260,000	7,920,000	Dependin g on previous round	Dependin g on previous round	15,180,000

Usage of Proceeds from Token Sale

Business Area	Max. budget in USD	Portion of Budget	Activities
Business Development & Sales	~4,554,000	~30%	Salaries and Sales Related Expenses
Smart-Contract Development	~6,070,000	~40%	Product development
Legal and Compliance	~2,277,000	~15%	Company establishment, Contracts, licenses
Liquidity Buffer	~2,277,000	~15%	Manage Uncertainty
Loan Warehousing	~0	~0%	Loan Warehousing ⁴

Team

The LiqEase core team holds deep expertise in launching and executing digital projects successfully both independently and for large corporations. The team has a variety of knowledge in various disciplines such as digital platforms, payments, fintech, FMCG, supply chain management, software engineering and more. Profiles of the team members are posted on www.traxia.co

³ in all phases combined the total amount of TMT sold can not be more than 400,000,000.00 during the Token Sale from March-May 2018

⁴ The Loan Warehousing Facility will be covered through 3rd party investors

Legal

Important Notice

This document contains the terms and conditions (the "**Terms**") which govern the Token Generating Event ("**TGE**") of the Traxia Foundation ("**Traxia Foundation**"). In the TGE, the Traxia Foundation will issue [ERC20] tokens (the "**Traxia Tokens**") to participants making contributions in the course of the TGE (the "**Participants**"), which grant certain rights as set out herein and in the Traxia Foundation's Whitepaper (the "**Whitepaper**"). Participants must read, understand and consent to both the Terms and the Whitepaper and sign a pertaining Token Purchase Agreement, all available at <https://www.traxia.co/terms-and-conditions>, before they participate in the TGE.

The Traxia Foundation is a foundation established under the laws of Switzerland and registered in the commercial register of the state of Zug; its legal domicile is in Zug. The projects which the Traxia Foundation pursues are described in detail, though not comprehensively, in the Whitepaper.

No Solicitation

Participants interested in supporting the Traxia Foundation and its projects may do so by acquiring Traxia Tokens and following the procedure set out herein as well as in the Whitepaper, having agreed in advance to the Terms and the Whitepaper.

Neither these Terms nor the Whitepaper do constitute an offer to sell, or a solicitation of an offer to buy, an interest in any jurisdiction in which it is unlawful to make such an offer or solicitation. Neither the Swiss Financial Market Supervisory Authority (FINMA), the U.S. Securities and Exchange Commission (SEC) nor any other federal, state, or foreign regulatory authority has approved a contribution to the Traxia Foundation or the acquisition of the Traxia Tokens. Furthermore, the foregoing authorities have not confirmed the accuracy or determined the adequacy of these Terms, nor is it intended that the foregoing authorities will do so. Any representation to the contrary is illegal. Accordingly, Participants will not be afforded the protection of respective laws.

Furthermore, Participants confirm that they have not been solicited to make a contribution to the Traxia Foundation or to acquire Traxia Tokens, but that any of their contributions were made upon their own request.

Experience and Suitability

Participants shall only participate in the TGE if and when (i) they have carefully considered and thoroughly reviewed the information contained in these Terms as well as in the Whitepaper, (ii) they fully understand the risks, costs, and benefits associated with receiving Traxia Tokens, (iii) they agree to be bound by these Terms, and (ii) the Whitepaper and the Terms are acceptable for them.

Significant experience with, and understanding of, the usage and intricacies of cryptographic tokens and blockchain-based software systems are essential for Participants to participate in the TGE. The Participants bear the sole responsibility to determine if the acquisition of Traxia Tokens or the potential appreciation or

depreciation in their value over time has tax implications for the Participants in their home jurisdictions.

Participants shall not construe these Terms as investment, legal, tax, regulatory, financial, accounting, or other advice, and they are not intended to provide the sole basis for any evaluation of a contribution. Prior to acquiring Traxia Tokens, Participants should consult with their own legal, investment, tax, accounting, and other advisors to determine (i) the potential benefits, burdens, and other consequences of such investment, including without limitation a Participant's financial situation and goals, and (ii) suitability and appropriateness of the acquisition, holding and disposition of Traxia Tokens. Participants are entirely responsible for the financial risk of their contribution during the entire term.

Rights related to Traxia Tokens

By participating in the TGE and obtaining the Traxia Token in the course of the latter, Participants acquire no rights whatsoever, neither expressed nor implied, related to the Traxia Foundation or its projects. In particular, Participants will have no influence over the governance of the Traxia Foundation, and no control over its distribution, allocation and use of the Participants' contributions, which may include covering costs incurred before the TGE, strategic reserves, and awards for beneficiaries (including without limitation parties affiliated with the Traxia Foundation, any related legal entities or the projects) who in the Traxia Foundation's view significantly contributed to the projects. It is thus in the Traxia Foundation's sole discretion how and to whom Participants' contribution will be given in the context of its projects; it will do so as it deems fit.

Participants' contributions in the course of the TGE are final and non-refundable. The Participants acknowledge that the Traxia Foundation is not required to provide a refund for any reason, and the Participants will not receive money or other compensation for any Traxia Tokens that are not used or remain unused.

A participation in the TGE involves a high degree of risk, volatility, and illiquidity. Participants need to be aware that by participating in the TGE, their entire contribution to the Traxia Foundation may be lost for whatever reason, in particular due to the fact that the Traxia Foundation and its project are still under development, and no warranties can be given that it will be successfully completed. The Traxia Foundation will – on a best efforts basis – take economically reasonable measures to issue the Traxia Tokens and to release the project, but it may be possible that the project launch will not occur, or that the Traxia Tokens, even if successfully developed and maintained, may not meet Participants' expectations at the time of purchase. As a consequence, the Traxia Token may have no value after all. Contrary to traditional start-up financings, Participants do not have any comparable rights at all; they are neither shareholders (equity financing) nor creditors (debt financing), and they do not have any corresponding rights whatsoever.

Furthermore, the Traxia Foundation may at any given time cancel the TGE for whatever reason and in its sole discretion. In addition, no guarantees can be given that the TGE will be carried out or completed in accordance with the time-frame as set out in the Whitepaper.

Authorization

Participants represent and warrant that they are authorized to acquire and obtain Traxia Tokens in their relevant jurisdiction, that they are not subject to a jurisdiction

where the distribution, acquisition, holding and resale of Traxia Tokens is restricted, and are of a legal age to be bound by these Terms.

They shall make their own investigations and evaluations of the contributions that will be delivered pursuant thereto, including the merits and risks involved. Participants shall inform themselves as to the legal requirements applicable to them in respect of the acquisition, holding, and disposition of the Traxia Tokens upon their delivery, and as to the income and other tax consequences to them of such acquisition, holding, and disposition. They shall accordingly observe all applicable restrictions.

These Terms shall not be used or relied upon by any person who is subject to laws which for whatever reason prohibit or restrict the distribution, publication, availability or use of these Terms and the Whitepaper or any actions taken thereunder, such as the distribution, acquisition, holding and resale of Traxia Tokens (including without limitation citizens or residents of the U.S., Canada, U.K., Singapore, North and South Korea, Hong Kong, China).

With regard to the aforementioned, including without limitation in case of regulatory actions against Participants who acquired Traxia Tokens despite any applicable limitations in their jurisdictions, Participants further represent and warrant that they will not hold the Traxia Foundation, its affiliates, officers, directors, agents, joint ventures, employees, advisors and suppliers, now or in the future, liable for any losses, costs or any direct, special, incidental, or consequential damages arising out of, or in any way related to, the TGE or the Traxia Foundation.

Forward-Looking Statements

Certain statements contained in the Terms or the Whitepaper constitute forward-looking statements. Such forward-looking statements, including the intended actions and performance objectives of the Traxia Foundation, involve known and unknown risks, uncertainties, and other important factors that could cause the actual results, performance, or achievements of the Traxia Foundation in its development of the project to differ materially from any future results, performance, or achievements expressed or implied by such forward-looking statements. No representation or warranty is made as to future performance or such forward-looking statements. All forward-looking statements in the Terms or the Whitepaper speak only as of the date hereof. The Traxia Foundation expressly disclaims any obligation or undertaking to disseminate any updates or revisions to any forward-looking statement contained herein to reflect any change in its expectation with regard thereto or any change in events, conditions, or circumstances on which any such statement is based.

Provision of Additional Information

The Traxia Foundation will cooperate with all law enforcement enquiries, subpoenas, or requests provided they are fully supported and documented by the law in the relevant jurisdictions. This also applies to information requests with regard to Participants from regulatory authorities.

Immediately upon first request, Participants shall provide to the Traxia Foundation information which it deems, in its sole discretion, to be required to maintain compliance with any federal, state, local, domestic or foreign laws, regulations or policies. The Participants acknowledge that the Traxia Foundation may refuse to distribute Traxia Tokens until such requested information will be provided.

Limitation of Liability

Participants release the Traxia Foundation and its respective predecessors, successors and assigns – to the fullest extent permitted by law – from all claims, demands, actions, damages, losses, costs and expenses of every kind and nature, known and unknown (including, but not limited to, claims of negligence, actions for breach of warranty, breach of contract, tort), arising out of or otherwise in connection with: (a) their contributions to the Traxia Foundation; (b) their participation in the Traxia Foundation's TGE; (c) their rights, responsibilities or obligations under these Terms and the Whitepaper; (d) their violation of these Terms; or (e) their violation of any rights of any other person or entity, including in relation to or arising out of disputes between the Traxia Foundation and them or between them and other participants in the TGE, and the acts or omissions of third parties, or (f) their envisaged future use of the Traxia Token.

Indemnification

Participants shall indemnify the Traxia Foundation and its respective predecessors, successors and assigns – to the fullest extent permitted by law – from and against all claims, demands, actions, damages, losses, costs and expenses (including attorneys' fees) that arise out of or are otherwise connected with: (a) their contribution to the Foundation; (b) their participation in the TGE; (c) their rights, responsibilities or obligations under these Terms and the Whitepaper; (d) their violation of these Terms; or (e) their violation of any rights of any other person or entity. The Traxia Foundation reserves the right to exercise sole control over the defense, at the Participants' expense, of any claim subject to indemnification under this section. This indemnity is in addition to, and not in lieu of, any other indemnity implied into or set forth in any written agreement between Participants and the Traxia Foundation or provided by any applicable laws.

Disclaimer of Warranties

Participants expressly agree that they obtain Traxia Tokens at their own risk and that the Traxia Tokens are provided on an “as is” basis without warranties of any kind, either express or implied, including without limitation warranties of title or implied warranties, merchantability or fitness for a particular purpose. Without limiting the foregoing, no warranty is given that the TGE will be uninterrupted, error-free or fully completed.

Severability

If any portion of these Terms is found illegal or unenforceable, in whole or in part, such provision shall, as to such jurisdiction, be ineffective solely to the extent of such determination of invalidity or unenforceability without affecting the validity or enforceability thereof in any other manner or jurisdiction and without affecting the remaining provisions of the Terms, which shall continue to be in full force and effect.

Updates to the Terms

The Traxia Foundation reserves the right, at its sole discretion, to change, modify, add, or remove portions of the Terms at any time during the TGE by posting the amended Terms on its website <https://www.traxia.co/terms-and-conditions>. Any Participant will be deemed to have accepted such changes by purchasing Traxia Tokens. If at any point Participants do not agree to any portion of the then-current version of the Terms, they should not purchase Traxia Tokens.

Governing Law and Dispute Resolution

These Terms shall be governed by, interpreted and construed in accordance with the substantive laws of Switzerland, without giving effect to its conflict of laws principles.

Any claim or dispute arising out of these Terms shall be submitted to the exclusive jurisdiction of the competent courts in Zug, Switzerland, and Participants hereby submit irrevocably to the jurisdiction of such courts with the exclusion of any other jurisdiction and formally waive any and all claims with respect thereto including any claim of forum *non conveniens*.

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Annex – Technical Details

Introduction

The smart contract represents an asset issued by a business entity after a trade has been confirmed. By providing the necessary infrastructure, issuing and listing providers earn TMT tokens for providing such services. The tokens TMT and the smart contracts make the creation of such an ecosystem therefore viable.

The purpose of this section is to

- (1) Introduce the Traxia Network, provide an overview of the transaction scheme and logic and looks at some components in more detail.
- (2) categorize and define a decentralized liquidity network (DLN) and argue for Traxia as a DLN.
- (3) Formalizes verifiable assets and constructs two scenarios, Liquidity Provision and a Liquidity Retrieval, governed by the information written to and read from smart contract, respectively.
- (4) Discusses use cases, connections to other systems, and how to make use of the ecosystem.

Our smart contracts provide liquidity and retrieval services from a network of independent liquidity providers and payment service providers to settle transactions through traditional channels. (a) issuers pay to get access to liquidity providers (b) liquidity providers get paid through traditional banking channels⁵ (c) issuing and listing providers earn tokens by providing the technical infrastructure

(1) Fundamental Components

The Traxia network and its tokens build upon two unique components:

1. Decentralized Liquidity Network (DLN): a network of independent entities that provision liquidity through issuing and listing providers. The Traxia network is an incentivized, auditable and verifiable DLN construct.
2. Verifiable Assets: Liquidity provision requests and retrieval requests are modeled as traditional orders on the markets provided by the Listing Providers within the Traxia network. Verifiable assets ensure that payments are initiated when a service has been legally agreed upon between a Buyer and Seller.

Participants

Any active business can participate as a client and make use of the services provided. Liquidity Providers need to hold the necessary licenses and may be classified as professional investor in the jurisdiction they are operating in.

⁵ This is subject to change depending on the regulatory environment. Settling all transactions on a blockchain does of course make more sense from a efficiency and technology point of view.

Clients pay to access additional liquidity through the technical infrastructure provided by the Traxia ecosystem and its partners (Issuing and Listing Providers) within the DLN. Liquidity Providers and Issuers settle their trade individually.

Issuing and Listing Providers are required to provide the services as described under section 'Traxia's Solution'. For the near future, the foundation is exclusively working and supporting LiqEase to guarantee quality and compliance since Traxia's board controls LiqEase. It will be a guided decentralisation process driven by the foundation due to the regulatory uncertainty and the need for guidelines and laws in the respective jurisdictions to make a truly decentralized Traxia ecosystem feasible and compliant.

Proof of issuing needs to be submitted by the Issuing Provider to the Network that an asset has been generated at a certain point in time. Missing proofs can be used to impose penalties on the Issuing Providers.

Listing providers need to proof that an asset is verifiable, liquidity has been provisioned and retrieved.

The Ecosystem

All users and partners that are providing software and infrastructure to make access to the Traxia network possible, are defined as one abstract entity: The Ecosystem. The Ecosystem acts as an agent to manage, validate and repair potential mistakes within the network.

The Ledger

Our smart contracts are applied on top of a ledger-based technology and we intend to use Cardano for our future development. The Ledger is accessible by the users at any given time. The Traxia DLN can be implemented and deployed on top of any other ledger that allows for the structure of the smart contracts as defined in this document.

The Issuing Providers

Issuing Providers offer the technological infrastructure to make it seamless and smooth for businesses to issue their assets using traditional web technologies in a combination with modern blockchain elements.

The Listing Providers

Liquidity (Supply) and the Demand for such is met at the markets operated by the Listing Providers. In brief, Issuers and Liquidity Providers set the prices for the services they request by submitting their orders to the markets. Those markets provide a way for users to identify suitable offers and execute deals.

Smart Contract Overview

The smart contracts are the basis of the Decentralised Liquidity Platform. Issuers (Buyers, Sellers) who make use of the smart contract 'template' and list their individual assets will need to purchase TMT to access the ecosystem.

The purchase and distribution of TMT on behalf of the Issuer will be automatically handled by the smart contract. (a) verifying the amount of a to be issued

asset in the currency chosen by Buyer and/or Seller via their digital signature (b) posting transaction and currency settlement requests to payment service provider (c) initiate TMT purchase order and distribution in accordance with the prices defined between Issuers and Issuing and Listing Providers.

The Traxia DLN can handle liquidity provision and retrieval requests Listing Providers and their markets. Issuers and Issuing, Listing Providers set the prices for the requested services.

Issuing and Listing Providers are independent business entities that act and conduct business on behalf of themselves and in their own best interest. To some extent they can be compared to mining providers where an offline hardware infrastructure is needed but the service is completely automatized and essential for the ecosystem to function and therefore necessary part of the Traxia ecosystem and network.

Smart contract overview	
<p>Network</p> <p>at each time t in the Network N:</p> <ol style="list-style-type: none"> 1. For each new Listing request <ol style="list-style-type: none"> (a) Check if the asset is in the right format (b) Check if all proofs are valid (c) Discard asset if any above fails 2. For each new asset a introduced in t <ol style="list-style-type: none"> (a) Issuing Contract attached (b) Invoice attached (c) Trade documents available (d) Trade contracts available (e) Discount defined (f) Maturity defined 	<p>Liquidity Provision Market</p> <p>at any time via Listing Provider</p> <ol style="list-style-type: none"> 1. Submit new ask and bid order for listed asset <p>at any time t via Listing Provider</p> <ol style="list-style-type: none"> 1. For each asset <ol style="list-style-type: none"> (a) Find matching assets based on requirements <p>on receiving asset i from issuer I</p> <ol style="list-style-type: none"> 1. Check if token matches asset defined upon issuing 2. Initiate payment through payment service provider
<p>Issuer</p> <p>at any time via Issuing Provider</p> <ol style="list-style-type: none"> 1. Submit new asset generation request 2. Submit Liquidity provision request 	<p>Liquidity Retrieval Market</p> <p>at any time via Listing Provider</p> <ol style="list-style-type: none"> 1. On Maturity of asset a (2) payment through a payment service provider to Issuer is initiated (3) TMT are distributed to Issuing and Listing Providers for their services

Definition of a Decentralized Liquidity Network

A Decentralized Liquidity Network (DLN) runs as an autonomous system that aggregates liquidity from various independent liquidity providers, providing liquidity provision and retrieval markets for Issuers in a self-coordinated way. Having a decentralized coordination without trusted parties in place is technically feasible through the use of protocols to verify and coordinate operations that are carried out by individual Issuers.

A DLN is governed by two main principles:

Put(asset) ! identifier: Clients execute the Put request to issue an asset under a unique identifier.

Get(identifier) ! asset: Clients execute the Get protocol to retrieve asset (information) that is currently stored using the identifier.

Properties

Integrity

No attacker can convince Issuers to accept altered or falsified assets.

Definition: A DLN scheme provides asset integrity if: for any successful Put execution for some asset (a) under identifier (i), there is no computationally-bounded adversary (A) that can convince an Issuer to accept falsified asset (a') at the end of a Get execution for identifier (i).

Retrievability

This property captures the requirement that, given our fault-tolerance assumptions of, if some asset has been successfully stored in and issuing and listing providers continue to follow the standards defined in a SPA token template, then users can eventually retrieve the asset.

Definition: A DLN scheme provides retrievability if: for any successful Put execution for asset under identifier, there exists a successful Get execution for identifier for which a user retrieves the asset.

Publicly verifiable

Definition: A DLN scheme is publicly verifiable if: for each successful Put, the network of issuing providers can generate a proof that the asset is currently being issued. It must convince any efficient verifier, which only knows the identifier and does not have access to the asset.

Auditable

Definition: A DLN scheme is auditable, if it generates a verifiable trace of operation that can be checked in the future to confirm liquidity was indeed provisioned for the right duration of time.

Incentive driven

Definition: A DLN scheme is incentive driven, if: Issuing, Listing and Liquidity Providers are rewarded for successfully offering liquidity and retrieval service, or penalized for misbehaving, so that the Issuing and Listing providers' dominant strategy is to provide a working technology infrastructure to make the provision of liquidity possible.

Lifecycle of a Digital Asset (Smart Contract) backed by a B2B Trade

1. Put: Buyers and Sellers issue digital assets using the smart contract infrastructure. Buyers and Sellers can issue their assets by paying Issuing and Listing Providers in TMT tokens. With a Put request, Buyers and Sellers issue a digital asset via an Issuing Provider and subsequently trigger a bid order on the market operated by a Listing Provider. After matching such a bid order with an ask order from a Liquidity Provider, the Buyers and Sellers send the digital asset to the Liquidity Provider. The parties sign the order and a transaction is recorded on the blockchain. The pricing of such orders is made between Issuers and Liquidity Providers.

2. Get: Buyers and Sellers retrieve digital assets using the smart contract infrastructure. The Get request is defined upon issuing in the Smart Contract already and executed in accordance with the maturity of the digital asset that has been defined by the Issuer upon creation. In general the duration should not extend 270 days but it is to the sole discretion of the Issuer to set such duration and maturity date.

Liquidity Provision and Retrieval Markets

Traxia makes use of markets that are operated by Listing Providers and aim to be decentralized in the future. Structure and Design of those markets is inherently defined by the requirements of TMT and the smart contracts representing a B2B trade. They are created and adapted around those given necessities.

The Liquidity Provision Market allows the Issuers to pay Listing Providers to list their assets on their marketplaces. The Liquidity Retrieval Market is an intrinsic requirement that is given by the smart contract structure and due to the limited duration and validity of any such listed digital asset represented by such smart contract. Issuers and Liquidity Providers can set their own supply and demand driven prices to initiate transactions based on available offers on the market.

DLN Requirements and Guarantees

To achieve integrity, retrievability, public verifiability and being incentive driven, the Traxia DLN established the following guidelines.

Integrity:

A Put request is initiated by Buyer and Seller after both parties signed such a request with their individually assigned private keys. The cryptographic hash resulting from such action is assigned to the digital asset and therefore allows to verify the integrity of the asset during the time of listing.

Retrievability:

Storing the asset in a decentralized way is a default feature of the blockchain we are building on. The digital asset is stored fault tolerant on various instances within the Ecosystem and a user can therefore increase the likelihood of recovery if one instance crashes or disconnects.

Public Verifiability and Auditability:

Issuing Providers are required to submit proofs of issuing to the blockchain. The validity of those blocks can hence be verified by any user in the Ecosystem using those proofs without the need to accessing the detailed information associated with the issued asset. Being stored on the blockchain, those immutable proofs are a trace that can be audited at any given time.

Incentive Compatibility:

Issuing and Listing providers are both rewarded for the services they are providing. When Issuers initiate a Put request, Issuing Providers are required to generate proofs and Listing Providers to have a fully operational marketplace to list the asset on behalf of the Issuer. Issuing Providers that do not create proofs will be denied access to the Listing Provider and are not entitled to any rewards. Listing Providers that don't operate a working marketplace as defined herein are not entitled to any rewards.

Confidentiality:

Issuers that desire their assets to be private, can list and offer those assets to preselected Liquidity Providers only.

Trade Validation and Settlement - Verifiable Digital Assets

Transactions that are traditionally conducted between Buyers and Sellers for the exchange of goods and services can only be validated to a certain extent. We however, need and require those transactions and underlying assets to be verifiable so that actors can verify the legitimacy of the asset and trade between Buyers and Sellers. Verifiable digital assets need confirmation via digital signatures from two or more parties and the transactions are transparent. Verifiable assets are a digital representation that aims to be stored in a decentralized fashion. Issuing and Listing Services are provided by independent parties. Issuing can be verified by the participants of the Ecosystem and the orders and transactions that are initiated on a Marketplace operated by a Listing Provider are recorded on a blockchain.

A verifiable asset can be issued with the intent to receive liquidity and be retrieved due to the limited amount of time such a digital asset is valid. Its existence and ownership status can be accessed at all time during its lifecycle on a blockchain explorer.

Future Work on Smart Contracts

Users will be able to interact with the smart contract by sending transactions to trigger specific functions. We aim to optimize those contracts to execute features that are desired by participants in the Traxia ecosystem. An example would be the interaction with a trusted Oracle to gather and verify data that is linked to the Issuer and the underlying collateral of a trade.

Those digital asset related contracts can have a variety of useful features such as contracted issuing and listing, predefined remuneration schemes, escrow services and more complex operations such as updating data associated with the asset based on the actual status of the trade and supply chain.

As mentioned above, our initial production system is currently running on Ethereum and an Ethereum Sidechain. There is a significant work in progress in terms of creating bridges between the different blockchains. We are most bullish on the developments of Cardano and intend to base our entire solution (TMT and the Smart Contract framework) on their technology. Our overall aim is to use and bring the most advanced technology to the Issuers and participants of the Traxia ecosystem and we will therefore support such initiatives, as well. Depending on the regulatory environment it would be great to integrate into crypto funds and cross border payment settlement systems such as SWIFT and others.

This document provides a clear path towards the construction and establishment of the Traxia Ecosystem. We still consider this work to be the initiator for discussion and further research on potential of a Decentralized Liquidity Network. Our ongoing work consists of adapting our current system to the features and principles described herein. Operating a system gives us the opportunity to develop according to market demand and feedback. Our future work will therefore be driven by the users and participants within the Traxia Ecosystem and we aim to make those works publicly available by the end of 2018 to get and make use of additional feedback from the community.