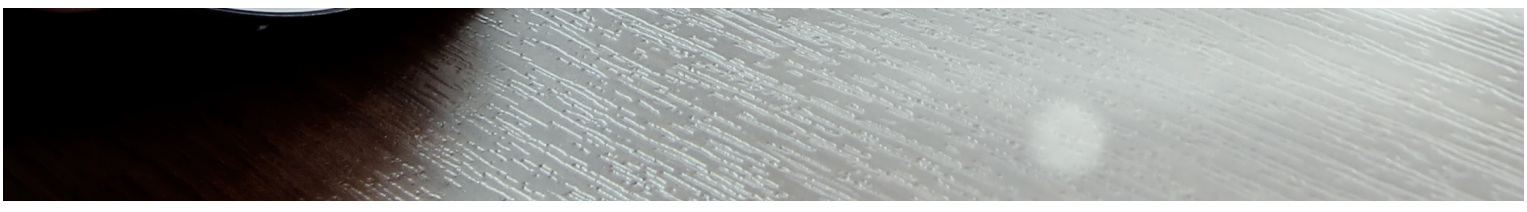
Blockchain: The key to Trade Finance challenges?

FISER CONSULTING
FINANCIAL SERVICES



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Executive Summary

Organisations rely on trade finance to support, encourage, and protect international trade mainly in the form of import and export transactions. Traditionally there are two main trade finance products which are the Documentary Credit (Letter or Credit) and Open Account. In the last 10 years, the increase in information, technology and the buyers' market have boosted the use of Open Account schemes versus Documentary Credit. This shift has increased the speed of trading and improved the importer/exporter relationship. However, the "new" open account schemes as well as the documentary credit bring operational, compliance, and transparency challenges. Many Financial Institutions are investing in Distributed Ledger Technology (Blockchain) prototypes to solve these challenges and outperform the market.

Blockchain is a solution that has promised to revolutionise financial services and traditional banking ever since it has been introduced by its predecessor Bitcoin in 2008. Blockchain will equip the trade finance business and the supply chain participants with a higher degree of transparency, security, and speed of operations. However, a key success criterion for Blockchain is full unity and connectivity between its users. In order to facilitate this, several Financial Institutions have formed strategic alliances (Consortium) to develop blockchain prototypes for the trade finance business, such as: R3CEV, Project Voltron, Digital Trade Chain, TKI Dinalog, Automated Letter of Credit (BofA and HSBC), HK Trade Finance, Dubai Blockchain Strategy and R3 Open Account.

There are similar characteristics (success factors) that have ensured the successful design, construction and implementation of a blockchain solution for trade finance. Organisations or consortiums that build effective blockchain applications have first identified the real data needs of the supply chain after which they have designed active smart contracts and have developed a minimum valuable product (MVP). The most important element for success is the capacity to transform the product and business.

FiSer Consulting is a niche consulting firm focused on business transformation within the financial industry. We have developed a framework and an implementation methodology that can guide organisations in implementing a successful blockchain application. The framework considers four high-level concepts, namely Strategy, Leverage Technologies, Culture and Environment, that will define the work streams of the blockchain implementation. Finally, in this paper we also focus on the five stages that direct the project plan and schedule activities.

Background - Trade Finance

The trade finance business is a well-known engine for economic growth and commerce. The origins of the trade finance business started with the need to exchange goods between parties, which initially is a good starting point if the system shows an underlying lack of trust between parties providing completion challenges[1]. This lack of trust presented Financial Institutions with an opportunity to become the bridge between importer and exporter. Hence the birth of 'Trade finance banking products' which help importers and exporters to manage international risk payments and help gain access to working capital tied to international trade transactions[2].

One third of total global trade is supported by a bank-intermediated trade finance product representing a total flow of approximately $6.5 to $8 trillion dollars a year[2]. Furthermore, it is estimated that for 2020, Financial Institutions would derive revenue to the sum of $47 billion USD for their trade finance businesses[3]. These facts alone show that the trade finance business is relevant not only in terms of monetary flows but as also in terms of an apparatus for ongoing financial development.

Financial Institutions that have the largest trade finance businesses are BNP Paribas, Citigroup, HSBC, JPMorgan Chase, and Mitsubishi UFJ Financial[3]. As for Dutch Banks, the Global Finance Magazine named Rabobank as the Best Bank in Commodity Finance (Global) for 2017, and ING as the Best Trade Finance Institution in the Netherlands[4]. However, Euromoney's Trade Finance Magazine placed ABN AMRO as the Best Commodities Finance Bank (Global) and as one that has received multiple prices in the category of 'Transactions - Deals of the Year'[5].

The evolution from Letter of Credit to Open Account

The market for trade finance has evolved from the Documentary Credit (Letter of Credit) to Open Account instruments. By 2014, open account transactions represented more than 80% of total trade[2]. Documentary credit was the primary source of funding 10 years ago, but currently the situation has shifted to the increased use of open account instruments[6].

A Documentary Credit (Letter of Credit), is a conditional payment instrument made by the issuing bank (importers bank) in favour of an exporter. It is most appropriate when one of the parties is not well known and the receiving party would like to have some guaranty by a bank to ensure payment or delivery. In a traditional documentary credit operation six institutions are involved: Exporter (Beneficiary), Importer, Issuing Bank (Importer Bank), Advising Bank (Exporter Bank), Trusted Third Party (for cargo audit), and Customs Authority[7].

On the other hand, an Open Account is a transaction where the exporter ships the goods first and receives the payment once the importer has received the goods. The open account works when the importer has sufficient credit information to assume the risk of delivery. For the open account, the importer is responsible for meeting the payment obligation without any warranty document[7]. This instrument has grown in the last years because some exporters are willing to take the risk to increase export volume[6]. As it can be noticed, information and trust are the main differences which dictate whether to use one instrument or the other.

An important element in modern trade finance is the concept of Supply Chain Finance (SCF) which is defined as the use of financing and risk mitigation practices and techniques. The SCF aims to optimise the management of the working capital and liquidity invested in supply chain processes and transactions. SCF is typically applied to open account trade and is

[1] Cassis, Youssef, Richard Grosman, and Catherine Schenk. 2016. The Oxford Handbook of Banking and Financial History. Oxford: Oxford University Pres
[2] Committee on the Global Financial System. 2014. CGFS Paper No 50 Trade Finance: developments and issue. http://www.bis.org/publ/cgfs50.pdf
[3] Technavio. n.d. Global Trade Finance Market 2016 – 2020. https://www.technavio.com/report/global-miscellaneous-global-trade-finance-market-2016-2020.
[4] Gordon Platt. Global Finance 2017. World's Best Trade Finance Providers 2017. https://www.gfmag.com/magazine/february-2017/minding-trade-finance-gap?page=2.
[5] ABN AMRO. 2017. ABN AMRO wins Best Commodities Finance Bank (global) at Trade Finance Awards 2017. https://www.abnamro.com/en/newsroom/press-releases/2017/abn-amro-wins-best-commodities-finance-bank-global-at-trade-finance-awards-2017.html
[6] Wang, Stephen. 2016. Open Account Trading: A Question of 'Adapt or Die'? https://www.linkedin.com/pulse/open-account-trading-question-adapt-die-stephen-wang.
[7] Luk, Kwai Wing. 2011. International Trade Finance a Practical Guide. https://books.google.es/books?id=Tng5vL8YXVsC&printsec=frontcover&dq=trade+finance&hl=es&sa=X&ved=0ahUKEwiUj8XtjbjVAhVBblAKHQBzCXsQ6AEINjAD#v=onepage&q&f=true.

triggered by supply chain events. SCF include different techniques and products that can be categorised in (1) receivables (receivables discounting, forfeiting, factoring, and payables finance), (2) loans (advance against receivables), (3) distributor finance, (4) advance against inventory, (5) pre-shipment finance and (6)Bank Payment Obligation[8].

Major challenges in Trade Finance

Particularly, the current challenges in trade finance are[6,9]:

- The Customer Due Diligence (CDD) process is difficult and resource consuming
- Many clients don't provide liquid collateral which is a main reason for deal rejection
- Shortage of available trade finance professionals in the job market
- An estimated financial gap of USD 1.6 trillion for SME companies
- SME's don't qualify for credit lines. On average 56% of the applications made by SME's are rejected
- Scarce support for exporters located in developing economies
- Excessive documentation for both open account and documentary credit products

The trade finance business is looking for technology innovations that improve operations and processes that generate trust in the supply chain.

Blockchain overview

As alluded to in the Executive Summary, Blockchain technology started in 2008 with the introduction of the cryptocurrency Bitcoin. This cryptocurrency is a peer-to-peer version of electronic cash that allows the exchange of resources between interested parties without using a middle men[9].

Blockchain architecture is a subtype of a centralised ledger comprised of multiple digitally recorded data, such as transactions agreements and settlements. The difference between traditional centralised databases and a Blockchain ledger is that traditional databases store information in one single place. Blockchain on the other hand, spreads incoming information across an extensive network of computers around the world.

The blockchain technology can be summarised in five basic principles[10]:

1. Distributed database. - Parties have access to the entire database, and they can freely verify the records of other partners.
2. Peer-to-Peer transmission- Direct communication between users.
3. Transparency, with pseudonymity. - Every transaction is visible to the network. The transactions occur between blockchain addresses.
4. Records are irreversible. - The information will remain permanent with a chronological order and available for the network.
5. Computational logic. - Users can set up rules that automatically trigger transactions and actions.

Below, Figure 1 describes the blockchain data process. It is important to note how the "blocks" are created for every transaction or piece of information that is being submitted.

[8] ICC. 2016. Standard Definitions for Techniques of Supply Chain Finance. https://cdn.iccwbo.org/content/uploads/sites/3/2017/01/ICC-Standard-Definitions-for-Techniques-of-Supply-Chain-Finance-Global-SCF-Forum-2016.pdf.
[9] FISER Consulting.2016. Blockchain The biggest financial innovation of this era? http://www.fiser.nl/wp-content/uploads/2014/10/Blockchain-Positioning-Paper.pdf
[10] Iansiti, Marco, and Karim Lakhani. 2017. The Truth about Blockchain. https://hbr.org/2017/01/the-truth-about-blockchain

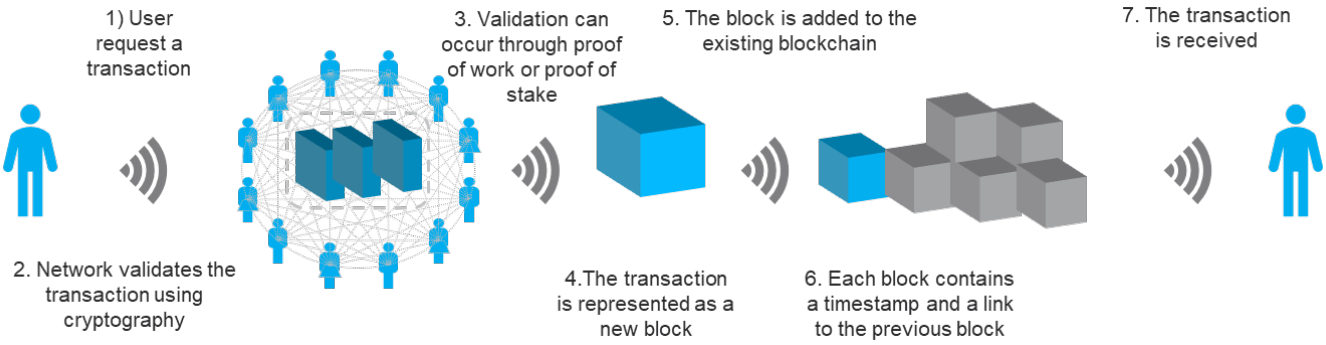

Figure 1. Blockchain process diagram

There are three major players participating in a blockchain application: Operators, Participants and Indirect Participants. Operators are the entities that codify and distribute the rules of the market[11]. The second group, the 'Participants' can see and validate transactions by verifying both the transaction outputs and signatures. 'Indirect Participants' are entities that haven't adopted the blockchain platform but still provide and make use of information. The roles described are not static, as one party can adopt three or more roles for a specific transaction.

Blockchain as a solution for Trade Finance?

Blockchain technology can help to solve the challenges that current trade finance businesses are facing[12]. As mentioned earlier, Blockchain technology can process a transaction in a decentralised way. This ability can be used for both tracking the economic resources pipeline as standardising financial information in the supply chain. These features will improve the process of verification and authentication by significantly reducing the uncertainty and risks that Financial Institutions are dealing with nowadays.

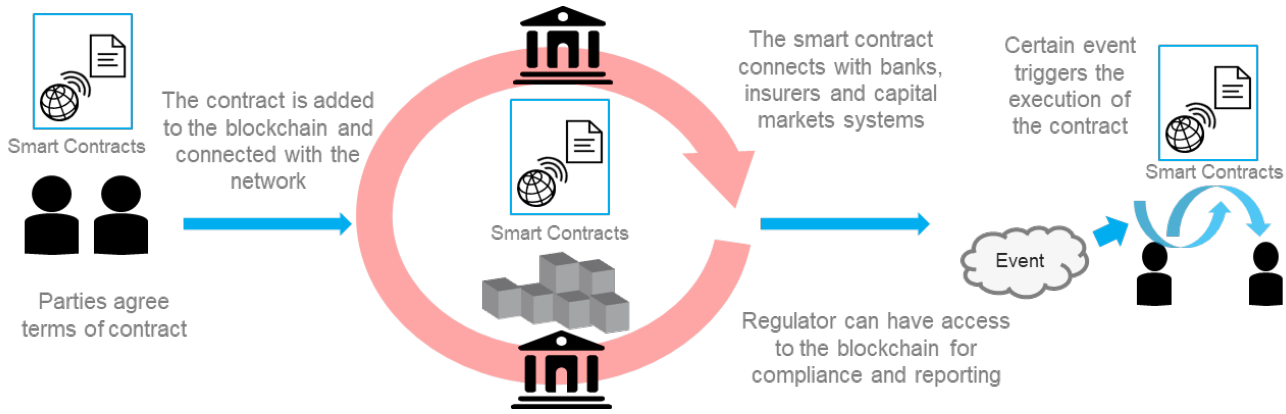

Figure 2. Smart Contracts Mechanics

Another important characteristic of the blockchain technology is the application of smart contracts. 'Smart contracts' is a term used to describe computer program code that can facilitate, execute, and enforce the negotiation or performance of an agreement (i.e. contract) using blockchain technology[13]. The use of smart contracts will reduce information asymmetries allowing full consensus between stakeholders and encourage the automation of payment orders and regulatory activities, ensuring the fast and secure flow of information, goods and financial resources.

Blockchain will transform the trade finance business and its operations for good. Usually, a documentary credit product follows a flow of activities that has various inefficiencies, such as manual processes, excessive documentation and long

[11] Digital Asset. 2016. "The Digital Asset Platform - Non-Technical White Paper." http://hub.digitalasset.com/digital-asset-platform-non-technical-whitepaper.
[12] Cong, He Zheng. 2017. "Blockchain Disruption and Smart Contracts." https://ssrn.com/abstract=2985764.

waiting periods for the vessel between verification points. The current "AS IS" processes for a documentary credit operation is shown in Figure 3. The relevant opportunity areas in the mechanism are highlighted in yellow.

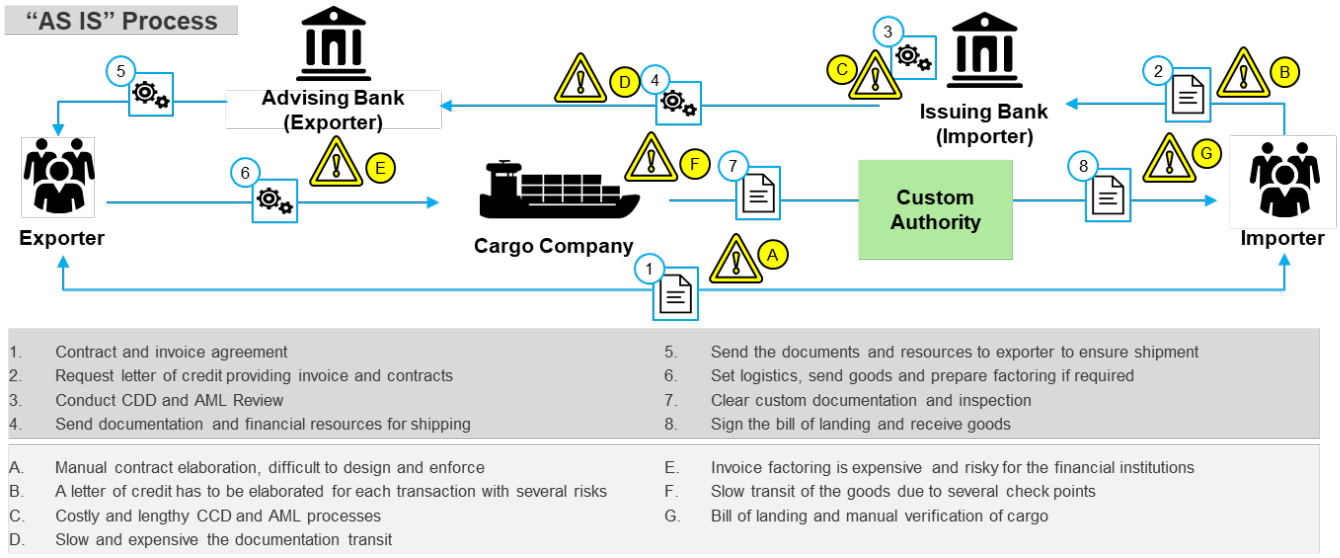

Figure 3 Documentary Credit Process "AS IS"

As mentioned before, the open account is currently the most used product in trade finance. The process of an open account product is relatively simpler than the documentary credit process. However, the exporter is required to bear more risk and each institution spends more resources in audit and verification activities. Figure 4 represents the general view of the open account process with its four major opportunity areas.

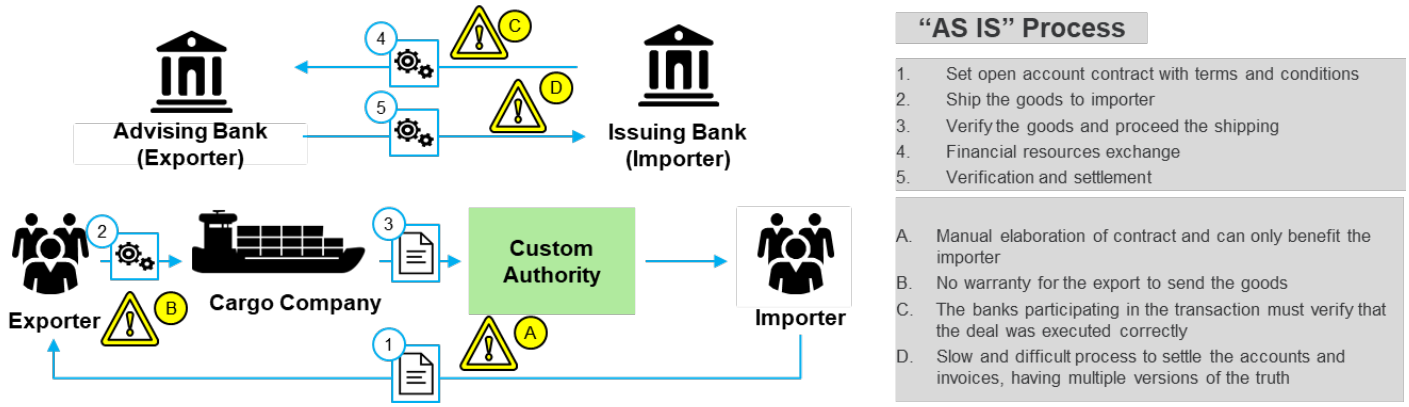

Figure 4. Open account process "AS IS"

Last but not least, blockchain brings several changes to the full integration of a Supply Chain Finance. More specifically, the implementation of a blockchain solution in trade finance will bring the following advantages[14]:

- Transparency, each participant in the supply chain knows the situation of the transaction in real time
- Traceability, every part or component can be traced to its origins, encouraging fair trading practices
- Immutability, the technology provides digital uniqueness using tokenisation as a form of cryptography
- Data privacy, parties will access only the required information per transaction
- Speed, blockchain will eliminate paper exchange and traditional communication channels
- Enforceability, smart contracts will automatically trigger transactions and impose agreements

[13] Blockchain Technologies. 2016. "What is a Smart Contract?" http://www.blockchaintechnologies.com/blockchain-smart-contracts.
[14] Chris Skinner. 2016. Applying Blockchain to Trade Finance. https://thefinanser.com/2016/08/applying-blockchain-trade-finance.html/

Figure 5 presents a general view of the "TO BE" process once the blockchain platform starts functioning. In each step of the supply chain an approval process would be required for each activity performed. The major challenge of a blockchain implementation is to include the tech savvy organisation into the scheme.

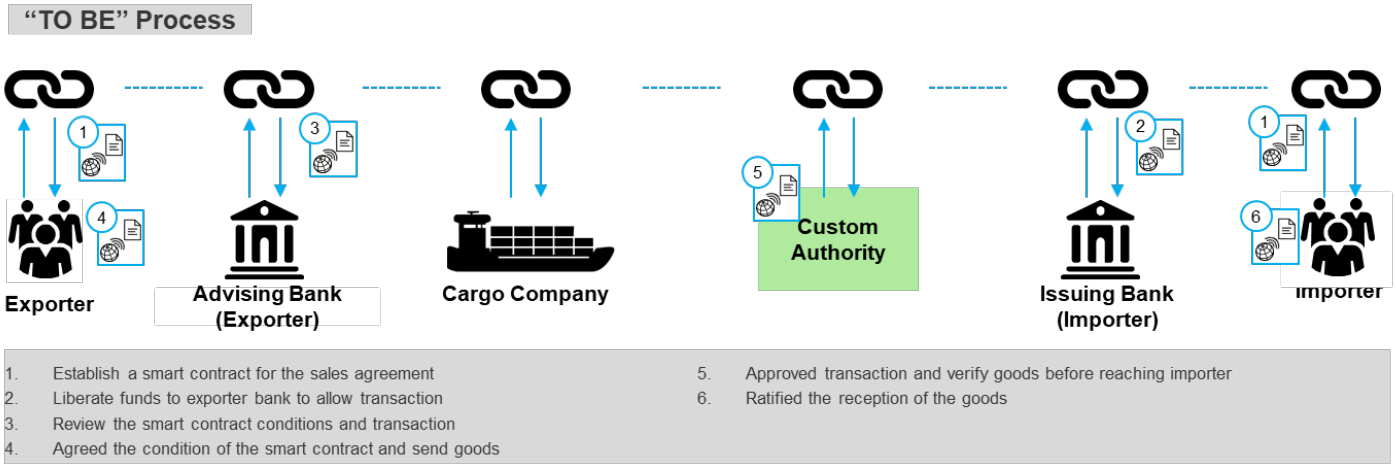

Figure 5. Trade finance process using Blockchain "To Be"

A blockchain platform will improve the flow of information, security and connectivity in the supply chain. Consequently, the Financial Institutions would rise the funding capital, increasing competition and economic growth. It is important that Financial Institutions adapt and evolve their current trade finance product offering to the supply chain new characteristics.

Relevant case studies

Digital Trade Chain

The Digital Trade Chain (DTC) is a blockchain solution that facilities trade between European SMEs. The project was originated by KBC and technology company Cegeka in July 2016. The project aimed to facilitate Documentary Credit for Belgian SME's that are involved or willing to participate in international trade.

DTC connects the importer and exporter who normally don't rely on each other. The chain provides an option to set up an open account or single Documentary Credit agreement. The app monitors the entire trade process from order to payment, allowing access to working capital resources, enhancing resources and optimising the entire process[15]. Figure 6 explains the process in detail by using the DTC tool.

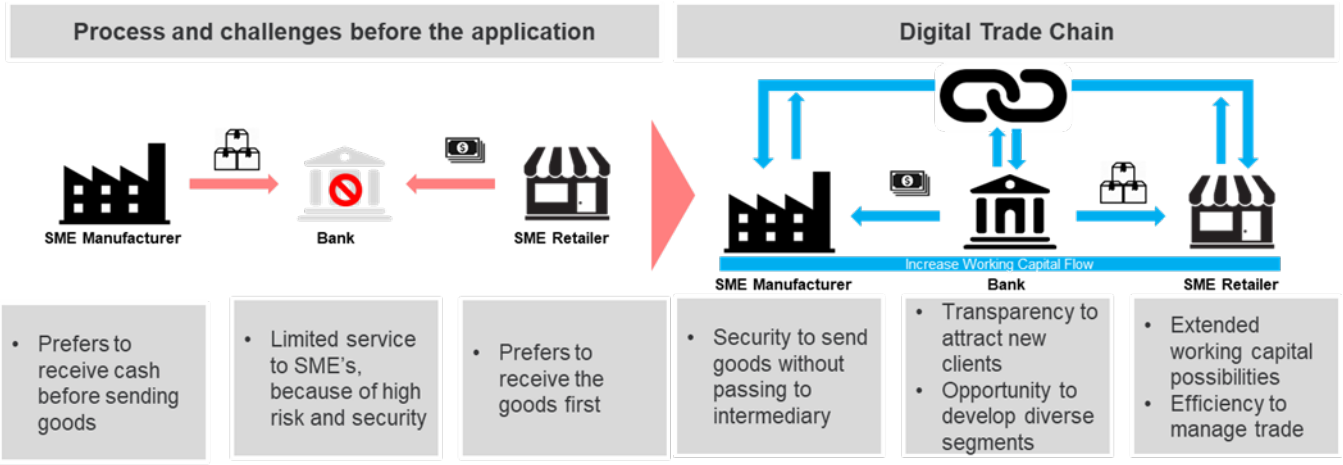

Figure 6. Before and After Digital Trade Chain

Seven months after the prototype release, KBC disclosed the expansion of the DTC to a consortium of six other major Financial Institutions such as Deutsche Bank, HSBC, Natixis, Rabobank, Societe Generale, and Unicredit. The full scalability and implementation date is planned for the fourth quarter of 2017 and will be conducted by IBM Hyperledger[16]. Once implemented, the tool will equip SMEs to trade in the domestic and international market by providing a consolidated view of their trade transactions, increase access to financial resources, optimise administrative tasks, and allow partners to track and trace transactions in real time 24/7.

[15] KBC. 2016. KBC and Cegeka trial ground-breaking blockchain application for SMEs. https://www.kbc.com/system/files/doc/newsroom/pressreleases/2016/20160712_DTC_ENG.pdf
[16] KBC. 2017. Seven Banks Plan Blockchain Platform to Help European SMEs Increase Trade. https://www.kbc.com/system/files/doc/newsroom/pressreleases/2017/20170116_PB_DigitalTradeChainMOU_ENG.pdf.

TKI Dinalog: Blockchain & Logistics Innovation

The TKI Dinalog project involved 16 partners applying blockchain and smart contracts for sharing logistical and contractual information between parties with a €2.2 million budget. The project included companies such as TU Delft, Port of Rotterdam, ABN AMRO, Windesheim, SCF community, TNO, Centric, Exact, SmartPort, Royal FloraHolland, FBBasic & Cirmar, BeScope Solutions, NBK Online Banking, Innopay, and TransFollow[17].

The platform considers three major initiatives[18]:

- **Asset based inventory financing**

  The initiative had the purpose of creating a highly reliable network of information that monitors inventory in the supply chain. Financial Institutions can automatically pinpoint the goods for financing, increasing the transparency in the transaction.

- **Supply chain financing**

  The application encourages the flow of information among participants in the supply chain, improving trust between parties and allowing Financial Institutions to grant working capital loans to finance import and export transactions.

- **Circular economics**

  'Circular economics' refers to extracting valuable materials from waste and then reconverting them into useful products. Using blockchain as a solution, the entire supply chain could guarantee circular economy certificate of all the products traded. This initiative could easily connect producers, brokers, sellers and final customers in the supply chain.

Once the project has been implemented the expected outcomes are to increase transaction speed and provide real-time access, integration of information, enhanced security in trading, an expanded network to new parties and a decrease in administrative expenses.

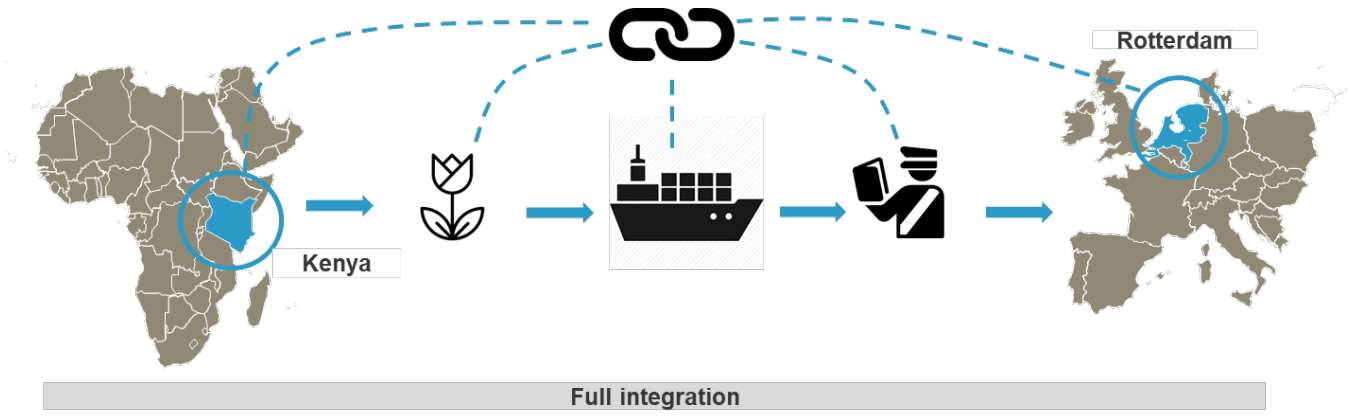

Figure 7. Full integration of the supply chain

[17] Hold Hold News. 2016. ABN AMRO and Port of Rotterdam to launch blockchain-based logistics project. https://news.hodlhodl.com/news/abn-amro-and-port-of-rotterdam-to-launch-blockchain-based-logistics-project-751

[18] Aljosja Beije & Janjoost Jullens. 2017. A lead via Blockchain technology Position paper on a digital Port of Rotterdam. http://nexteconomy.nl/media/uploads/2017/06/A-lead-via-Blockchain-Technology-BeSCOPE-Wolfpack.pdf

Important Consortium and Applications

Financial Institutions believe that the best way to cope with innovation is by forming strategic alliances, also known as "consortiums"[19]. For the implementation of Blockchain, the most representative consortium is the R3 consortium, that involved over 44 institutions and a coverage of 15 countries worldwide by May 2017 [20]. Another good example is the creation of the Lyra Network in Spain. This consortium comprises of 21 members across Financial Institutions, technology companies, consulting firms and universities[21].

In general, blockchain consortiums aim to achieve standardisation of data and to promote innovation between parties. In the trade finance industry, the impact of forming a consortium is far more concrete because of current consortiums that have already developed blockchain application prototypes that intend to migrate current processes and documentation to the platform. An analysis of several press releases and other communications reveals that there are six major blockchain consortiums dedicated to develop trade finance applications (see Table 1). The analysis only takes consortiums into account that involve more than one Financial Institution and have "digitalisation" as its primary objective.

The blockchain consortiums for Trade Finance are:

- R3CEV. - Fifteen members of the R3 consortia release a trade finance app based on blockchain.
- Project Voltron. - Eleven members of the R3 consortium develop a blockchain application for trade finance having as technology partner CGI.
- Digital Trade Chain. - Lead by KBC, seven banks developed a prototype to incentives and manage trade finance for SMEs European clients.
- TKI Dinalog. - The Port of Rotterdam, ABN AMRO and the National Bank of Kuwait (NBK) together with twelve diverse partners developed a blockchain application with the scope to improve trade finance processes, apply circular economies principles and enhance inventory management.
- Letter of Credit (BofA and HSBC). - This initiative was conducted in cooperation with the Infocomm Development Authority of Singapore (IDA) to improve the flow of trade finance in Singapore.
- HK Trade Finance. - This project was led by the Hong Kong Monetary Authority (HKMA) and Deloitte to create a trade finance platform with the major trade finance banks in the region.
- Dubai Blockchain Strategy. - This initiative is part of Dubai's overall digital strategy. It set a parameter of cooperation between Emirates Airlines, du (Emirates Integrated Telecommunications Company), Aramex, and two banks in the region to create a blockchain application for SCF.
- R3 Open Account.- Global initiative involving banks from three continents using Trade IX ledger.

Currently, HSBC participates in four major consortia in the trade finance business. ING is the most active Dutch participant being part of the R3CEV and Project Voltron. Additionally, ABN AMRO has developed a strong connection with The Port of Rotterdam to bring an automated response and pipeline for international trade in the Netherlands.

[19] John Plansky, Tim O'Donnell, and Kimberly Richards. 2016. A Strategist's Guide to Blockchain. https://www.strategy-business.com/article/A-Strategists-Guide-to-Blockchain?gko=0d586
[20] R3. 2017. R3 secures largest ever investment for distributed ledger technology with US 107 million from over 40 institutions. https://www.corda.net/wp-content/uploads/2017/05/R3FundingPressRelease.pdf.
[21] BBVA. 2017. BBVA joins the Lyra network, the first Spanish blockchain consortium. https://www.bbva.com/en/bbva-joins-lyra-network-first-spanish-blockchain-consortium

Table 1. Financial Institutions in trade finance consortiums

Name of the Bank / Consortia	R3CEV [1]	Project Voltron[2]	Digital Trade Chain [3]	TKI Dinalog [4]	Automated Letter of Credit [5]	HK Trade Finance [6]	Dubai Blockchain Strategy [7]	R3 Open Account [8]	Total
HSBC		1	1		1	1			4
BBVA	1	1						1	3
ING	1	1						1	3
Intesa Sanpaolo	1	1						1	3
Barclays	1							1	2
BNP Paribas	1							1	2
Wells Fargo	1							1	2
Scotiabank	1	1							2
US Bank	1	1							2
Danske Bank	1		1						2
Natixis	1		1						2
UniCredit	1		1						2
Bangkok Bank		1						1	2
RBS		1						1	2
Commonwealth Bank of Australia	1								1
Nordea	1								1
UBS	1								1
Bladex								1	1
Commerzbank								1	1
CTBC Bank								1	1
Shinhan Bank								1	1
Mizuho		1							1
SEB		1							1
ABN AMRO				1					1
Banco Santander							1		1
Bank of America					1				1
Bank of China						1			1
Bank of East Asia						1			1
Hang Seng Bank						1			1
KBN			1						1
NBK				1					1
NDB Emirates							1		1
Rabobank			1						1
Societe Generale			1						1
Standard Chartered						1			1

- Dutch Bank

[1] Rizzo (2016) 15 R3 Members Trial Distributed Ledger Tech for Trade Finance retrieved from https://www.coindesk.com/15-r3-members-trial-distributed-ledger-tech-trade-finance/
[2] Allison (2017) Eleven banks develop trade finance app on R3's Corda DLT platform retrieved from http://www.ibtimes.co.uk/eleven-banks-develop-trade-finance-app-r3s-corda-dlt-platform-1633814
[3] IBM by Slocum (2017) Seven Major European Banks Select IBM to Bring Blockchain-Based Trade Finance to Small and Medium Enterprises retrieved from http://www-03.ibm.com/press/us/en/pressrelease/52706.wss
[4] Hold News (2016) ABN Amro and Port of Rotterdam to launch blockchain-based logistics project retrieved from https://news.hodlhodl.com/news/abn-amro-and-port-of-rotterdam-to-launch-blockchain-based-logistics-project-751
[5] Rizzo (2016) Bank of America, HSBC Unveil Blockchain Supply Chain Project retrieved from https://www.coindesk.com/hsbc-bank-america-blockchain-supply-chain/
[6] Joseph Young (2017) Hong Kong Launches Blockchain Trade Finance Platform With Deloitte, Top Banks retrieved from https://cointelegraph.com/news/hong-kong-launches-blockchain-trade-finance-platform-with-deloitte-top-banks
[7] Ian Murphy (2017) Blockchain used for import/export in Dubai retrieved from https://www.enterprisetimes.co.uk/2017/02/09/blockchain-used-importexport-dubai/
[8] Finextra (2017) R3 and 12 banks plan overhaul of open-account trade finance retrieved from https://www.finextra.com/newsarticle/31113/r3-and-12-banks-plan-overhaul-of-open-account-trade-finance?utm_medium=dailynewsletter&utm_source=2017-9-27

Despite the advantages of forming a consortium, some organisations prefer to develop blockchain applications on their own or with the help of another non-financial organisation, such as a start-up company, research institute or technology provider. Table 2 shows the most relevant individual efforts to create trade finance blockchain applications.

Table 2. Individual efforts for Blockchain Trade Finance

Sponsor bank`	Other Partners	Description
Mizuho Bank[1]	Marubeni Corporation Sompo Japan Nipponkoa Insurance Inc.	A letter of credit and all related processes were managed in the blockchain for a trade operation between Japan and Australia.
Barclays[2]	Wave	A letter of credit between Ornua and Seychelles Trading Company, the funds were transfer via Swift.
Scotiabank[3]	AlphaPoint	A full-stack platform that allows integrated communication with legacy systems, high throughput, user-level access controls and deterministic smart contracts.
Commerzbank[4]	Fraunhofer-Institute for Material Flow and Logistics (IML)	Proof of concept of the blockchain application to optimise the trading flow. This initiative is also considering the application of Internet of Things and other container technologies.
Kotak Mahindra Bank [5]	Deloitte JP Morgan Singapore	Completed a trade finance blockchain Proof-of-Concept. The initiative focus on the digitalisation of the letter of credit.
SEB[6]	CGI	Developed a platform called Trade360. The platform delivers all the infrastructure and support necessary for trade finance.
Alfa – Bank [7]	S7 Airlines Deloitte	Closed a deal using a smart contract to settle and record a Letter of Credit on a blockchain platform.
UBS[7]	IBM	Replicates the entire lifecycle of an international trade transaction on Hyperledger`s Fabric blockchain.

[1] Stan Higgins.2017. Mizuho Completes Blockchain Trade Finance Trial. https://www.coindesk.com/mizuho-completes-blockchain-trade-finance-trial/
[2] Barclays. 2016. The blockchain revolution in trade finance. https://www.barclayscorporate.com/insight-and-research/trading-and-exporting/blockchain-revolution-in-trade-finance.html
[3] Diana Ngo. 2017. AlphaPoint Completes Blockchain Trial With Scotiabank. https://bitcoinmagazine.com/articles/alphapoint-completes-blockchain-trial-scotiabank/
[4] Charles Brett.2017. Yet another trade finance/blockchain initiative! https://www.enterprisetimes.co.uk/2017/07/06/yet-another-tradefinanceblockchain-initiative/
[5] Dan Cummings. 2017. Indian Bank Completes Trade Finance Blockchain Trial. https://www.ethnews.com/indian-bank-completes-trade-finance-blockchain-trial
[6] Charles Brett. 2017. Swedish bank adopts global trade finance platform. https://www.enterprisetimes.co.uk/2017/06/02/swedish-bank-adopts-global-trade-finance-platform/
[7] Carlo R.W. De Meijer . 2017. Blockchain: accelerated activity in trade finance. https://www.finextra.com/blogposting/13593/blockchain-accelerated-activity-in-trade-finance

Finally, there are some IT providers that developed trade finance applications in the blockchain. These solutions are ready to use and they only require a fee to access the platform. Several consortiums and organisations have chosen IBM to scale and build the blockchain application in Hyperledger.

In conclusion, it is important to understand the current ecosystem in trade finance blockchain developments in order to choose the strategy that best fits with the expectations of the client.

Table 3. Ready to use blockchain trade finance applications

Company	Description
IBM	By 2017, the company has develop and scale up several trade finance initiatives. Additionally the company has done strong collaboration with supply chain specialist companies such as Maesk.
TradeIX[1]	World's first shared platform for trade finance. Powered by distributed ledger technology.
Satoshi Systems[2]	Blockchain platform for trade finance that considers inventory management and payments management.
Populous[3]	Invoice and trade finance platform built using blockchain technology.
T-Mining[4]	Developing and testing blockchain-based applications for container logistics with the Port of Antwerp.

[1] TradeIX. 2017. TradeIX launches blockchain platform for trade finance. https://www.finextra.com/pressarticle/69592/tradeix-launches-blockchain-platform-for-trade-finance
[2] Satoshi Systems. 2017. About. https://satoshi.ltd/
[3] Populous.2017. What is Populous? http://populous.co/
[4] T-Mining. 2017. http://www.t-mining.be/

Key success factors

Since the introduction of Bitcoin in 2008, the financial service industry has looked for concrete applications of the blockchain technology. The trade finance business has improved its standardisation, transparency and agility since then.

Major Financial Institutions have created consortiums to share knowledge and build trade finance platforms that increase market share and reduce time and cost of current processes. After analysing the case studies of major consortiums such as R3CEV, Project Voltron, Digital Trade Chain, TKI Dinalog, and Automated Letter of Credit, we can conclude that a successful blockchain implementation shares the following common factors:

- **The smart contracts requirements are standard to all stakeholders**

Smart Contracts are a powerful tool that can transform the relation between importer and exporter for good. However, if the smart contract is poorly designed or lacks consensus it can prove to be irrelevant for the supply chain participants. It is important that authorities and less tech-savvy organisations recognise the legitimacy of the smart contract.

- **MVP (minimum valuable product) should solve essential business need**

Organisations that are motivated to follow the innovation hype can't design blockchain solutions that represent low value to customers. A blockchain implementation should be revolutionary in terms of the product, the relationship with the buyer, the agreement(s) and communications.

- **Understand the security characteristics of a public and private ledger**

Blockchain was designed in an open technology framework which makes it virtually impossible to hack[22].The platform ensures security by a combination of smart contracts, tokens and consensus validation. Table 4 shows a compares features and shows differences of a public and private ledger[22] [23]:

Table 4. Security features, private vs public ledgers

Characteristic	Public	Private
Written transactions	Permissioned.- Allows anyone to read and writte transactions	Permissionless- restricted access
Verification	Consensusprotocol.- Process in which a network of nodes confirms the record	Controlledenvironment for which nodes can read and verify transactions
Network arquitecture	The core application is a transaction database, that is shared by all nodes in the network	Operators control the use and connectivity of the network nodes
Transaction reversibility	Not possible	If required and decide by operators, the ledger can reverse a transaction in case of theft
Changes in rules	Changes are only adopted if they are in the interest of the entire system and individual users can propose those changes	Operators may choose unilaterally deployed changes, even when partiers disagree

[22] Vamsital. 2016. The Architecture of Blockchain. http://www.vamsitalkstech.com/?p=1615.
[23] Berke, Allison. 2017. "How Safe Are Blockchains? It Depends." https://hbr.org/2017/03/how-safe-are-blockchains-it-depends.

- **Avoid scanned documentation upload**

Currently, trade finance processes involve large amounts of physical documentation. According to a survey conducted by the ICC (2017), trade finance executives commented that open account agreements and documentary credit require a large quantity of signed documentations and physical data sharing. With a blockchain application, every written authorisation required can be automated in a smart contract.

Organisations should avoid uploading scanned documentation to the blockchain. This method of validation is not only impractical but also inappropriate because computers are no able to read scanned documents yet. There is no doubt that a successful trade finance blockchain solution will substitute the current documentation (the bill of landing, letter or credit, etc) for parameters in a smart contract.

- **Identify the entire data ecosystem in the supply chain**

At the first stage of the project, the organisation should be capable of identifying and mapping the entire data flows (inputs / outputs) of the supply chain. This analysis will help the organisation to understand the technology maturity and the data capabilities of supply chain. Additionally, the blockchain application has to become the "ultimate layer of audit" to the supply chain.

Implementation framework

FiSer Consulting can assist organisations in the adoption and implementation of Blockchain. As presented in this document, a blockchain implementation program is a sustainable challenge, however, with the proper guidance, the application can exceed expectation and create real value to customers. Figure 8 represents the FiSer Consulting framework for blockchain implementation.

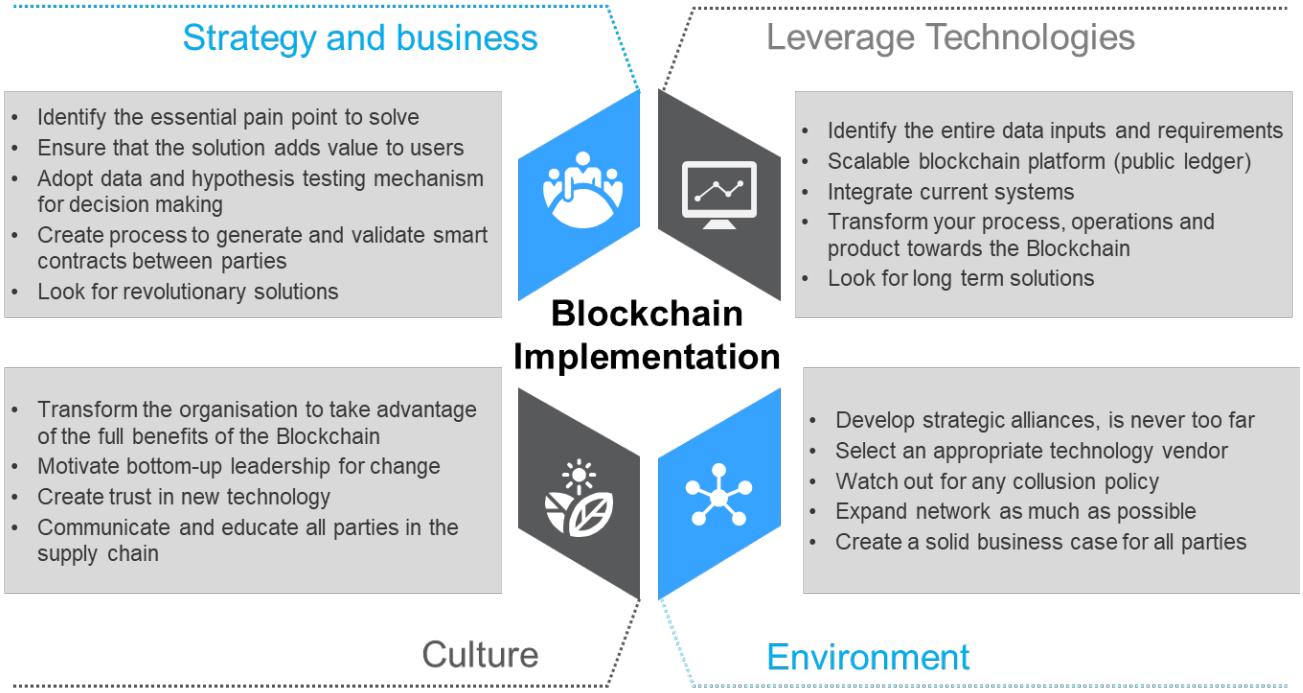

Figure 8. FISER Consulting Blockchain Implementation framework

- **Strategy and business**

A solid understanding of the client information combined with the blockchain technology can lead to a solution that revolutionises current product offerings. The blockchain solution should deliver real value to the customers beyond a simple "digitalisation" advantage.

- **Leverage technologies**

The main idea behind this concept is the standardisation of data inputs, outputs, process and requirements between all the members of the supply chain. This standardisation of data has the objective to consolidate the blockchain as the "single source of truth". Organisations need to develop internal long-term re-engineering processes to adapt their data management systems and process to understand the information contained in the smart contracts (hash and tokens). The information contained in smart contracts should be sufficient enough to conduct business.

- **Culture**

A successful blockchain implementation is accompanied by an organisational and cultural change. To make the transformation smoother, each party of the consortium should see the real advantages of the blockchain application. The first taste of the application will happen with the development of the Minimum Valuable Product (MVP). This prototype has to represent a real value to the end users. Finally, the supply chain has to trust the blockchain application and adapt their current business processes .

- **Environment**

Blockchain requires cooperation. Once the organisation has identified the complete data flows in the supply chain, it is important to build strong strategic alliances with each group or member. A strong strategic alliance is a balance between formal and informal initiatives (contract agreements and social gatherings). Achieving a high degree of integration will allow the stakeholders to embrace the blockchain technology in a more efficient way. The network of collaboration has to be extended as much as possible to avoid leaving less tech savvy groups behind. Finally, the selection of the technology vendor plays an important role: the vendor must be independent of any ledger.

Our methodology

For an effective implementation of a blockchain, FiSer Consulting advises to follow a 5 phase methodology.

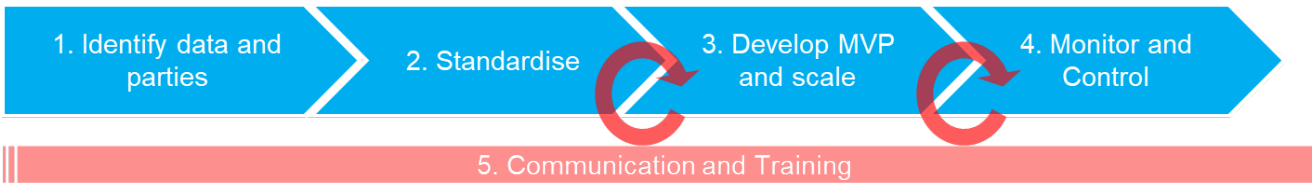

Figure 9. Blockchain implementation methodology

1. **Identify data and parties**

The first stage tit's about identifying and map the supply chain data flow, users and stakeholders. The organisation that is willing to fully understand the data necessities of each stakeholder will ensure the success of the blockchain implementation. Additionally, the leading organisation has to assess the technical capabilities of each stakeholder to design a solution that engages as many participants as possible. At this stage, it is necessary to start integrating a consortium of parties. Finally, the consortium has to design a business case that reflects the information necessities of the supply chain. The business case will not only support the financial investments but it would also engage the supply chain into the project.

2. Standardise

The second stage of the methodology has four objectives. First, it's about defining the best in class data collection mechanism among the participants in the supply chain. Second, a single source of truth of the data collected should be establish. Third, a data collection method should be defined for each stakeholder and finally, requirements and rules required per transaction should be designed and discussed, as well as smart contracts.

3. Develop MVP and scale

The Blockchain application (private or public) should fit the current infrastructure of the operators and participants. In most cases, some organisations in the supply chain may not have the intention or the capacity to enter the consortium. That is why it is important to define the role of any organisation in the new scheme. Moreover, an early MVP development will allow the consortium to rethink the strategy and relaunch the project.

The Consortium of the project has to invest financial resources in engaging the final user with the tool. The final user will prove and validate the relevance of the MVP. Once the MVP has passed the trial, the consortium should scale the prototype and select an IT vendor.

4. Monitor and Control

The blockchain application should provide sufficient information to follow the supply chain pipeline. As mentioned before, this pipeline has to be positioned as the "ultimate layer of audit", meaning that organisations inside the consortium completely trust the information that the blockchain contains. This features leaves other databases or internal systems behind. The process of "migration" will require change management initiatives directed to the end users, customers and other relevant stakeholders.

5. Communication and training

The communication and training initiatives must cover the lifecycle of the project. It is important to define a key message per stakeholder with a strong focus on the final user. After this step, a communication, marketing and change management plan should be developed and launched. The final step is to conduct workshops to teach final users new processes and the way in which activities need to be conducted.

Glossary of terms

Term	Definition
AML	Anti-Money Laundry
BofA	Bank of America
CDD	Customer Due Diligence
DTC	Digital Trade Chain
HKMA	Hong Kong Monetary Authority
IDA	Infocomm Development Authority of Singapore
IT	Information Technology
ICC	International Chamber of Commerce
MVP	Minimum Valuable Product
NBK	National Bank of Kuwait
SME	Small and Medium Enterprise
SCF	Supply Chain Finance
USD	United State Dollar

Next steps

For further information on Blockchain for Trade Finance and where FiSer Consulting can assist you, please contact:

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Dirk has over 20 years of experience in Global Financial Markets, particularly in the Investment Banking and Corporate & Commercial Banking industries. Dirk's consulting skills lie in risk management, capital management, front office transaction management, the implementation of asset & liability management and treasury functions, and the implementation of regulatory processes, including Basel II, III, MiFID and EMIR.

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Roberto has over 5 years' experience as management consultant, leading and promoting change for top Financial Institutions. Roberto's consulting skills are mostly in change/project management and business strategy. He has participated in relevant organisational transformation, cost distribution projects and risk management initiatives.

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Constanza has over 2 years' experience in Management Consulting. She has gained extensive experience working in a wide range of industries such as Financial Services, Retail, Utilities, Pulp & Paper, and Insurance, and different Finance related sectors such as Business Development, Risk Management, Project Evaluation and Strategic Planning.

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