DEVELOPMENTS IN NEW TECHNOLOGY
The ‘Buzz’ of the Blockchain
Developments in New Technology

The ‘Buzz’ of the Blockchain

- What is Blockchain?

- How does Blockchain work?

- Blockchain use cases

- Future direction and developments

- Discussion
What is Blockchain and how does it work?

**Key Features**

- A block chain is a **distributed shared database**; every participant has access to the ledger.
- A block chain provides **trust**, **security** and **non-repudiation** in transactions and messages. You can prove or check if an entity has sent you a message or created a transaction.
- A blockchain is an incorruptible digital ledger of financial transactions that can be programmed to record virtually anything of value.
- Data **cannot be lost** or corrupted by any of the participants.
- The addition of information on the ledger can be propagated through the network in a very short time.
- Cryptography can provide various degrees of **anonymity**; having a copy of the ledger doesn’t mean that you can read it all.
- As the ledger contains all the **history of transactions**, audit, compliance and error handling are easy to perform.
- As the ledger is duplicated for each participant it is easy to create **collective** tasks.
- Smart contracts can be used to model **enforceable decisions**.
- Combined with data sharing, it is possible to achieve very fast and secure **workflow**.
Blockchain
The buzziest of buzzwords

“Blockchains Will Change the World”
– Fortune

Blah BLAH blah Buzz Word blah blah . . .
What’s so smart about blockchain?

*The hype versus the hope*

CBA and Wells Fargo use blockchain

Standard Chartered & DBS Work on Blockchain Tech for Trade Finance

"We found that we didn't want a Blockchain, we want to be Blockchain inspired"
In a blockchain, transactions are bundled into blocks and chained together. The data is shared but sharing data is not new. DLT is about sharing control of the data.

All blockchains are distributed ledgers, but not all distributed ledgers are blockchains!
Inspired by Blockchain

*Incorporating smart contracts and smart objects*

The blockchain delivers distributed trustworthy storage. The smart contract delivers distributed trustworthy calculations. Smart contracts provide *automated trustworthy workflow between parties without a central specific coordinator*, hence reducing operational risk.

In addition the smart contract can be used in support of:

- a) automatic re-ordering of stock
- b) automatic upload of PO for financing (self service)
- c) translation of data into doc prep or paperless trade
- d) Potential extension into artificial intelligence

The use of track and trace devices enables us to monitor the location and condition of smart objects in transit, hence reducing operational risk.

This technology can eventually be extended further back into the supply chain to guarantee the provenance of goods at source in support of sustainable trade.
Conventional trade finance

Conventional paper-based transaction

- Exporter
- Bank
- Insurance
- Transportation company
- L/C
- B/L
- Paper documentation

High cost
Long transaction time

Trade finance using blockchain

Blockchain-based contract management

- Exporter
- Bank
- Smart contract
- Transportation company
- Importer
- Bank
- Smart contract

Transactions
- Sale agreement (including insurance policy)
- Shipment
- Payment

Low cost
Speeds up transaction

B/L: bill of lading  L/C: letter of credit
Payment methods and the underlying trade contracts can be modeled as smart contracts on blockchain to provide payment certainty to the seller.
Potential Benefits of using Blockchain

**Business features:**
- Efficiency gains and costs savings through reduced intermediation
- Reduced operational risk through increased transparency
- More efficient management of the cash conversion cycle (corporate perspective)
- More efficient use of limited amounts of regulatory capital (bank perspective)
- Increased transparency; the bank and the supplier can see in real-time the value of the goods, when they have been sold etc.
- Under a 'permissioned' blockchain with smart contracts, the legal liability of all parties involved is clear and the authenticity of conclusions provided by the system are guaranteed.

**Technical features:**
- Use of **smart contracts** to generate instructions for downstream processes (such as payment instructions or moving collateral) if reference conditions are met.
- **Zero-Knowledge cryptography** * is a method by which one party can prove to another party that a given statement is true, without conveying any information apart from the fact that the statement is indeed true.
- **Mutual consensus verification** allows a network to agree updates to the database collectively, with a certainty that the overall dataset remains correct at all times without the need for a central governing authority.

* Security is achieved using a round robin consensus based algorithm and Zero-Knowledge cryptography; Zero-Knowledge cryptography is the only way to achieve true anonymization in blockchain and is already implemented in Ethereum, for example.
Benefits of blockchain in trade finance
A blockchain-based trade finance model offers significant benefits over the traditional model

<table>
<thead>
<tr>
<th>Activity</th>
<th>Traditional model</th>
<th>Blockchain-based model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transaction settlement time</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Need for documentation</td>
<td>Large number of documents to be managed and reconciled</td>
<td>Only one document to be managed and reconciled</td>
</tr>
<tr>
<td>Need for correspondent banks</td>
<td>Required as intermediaries</td>
<td>Not required</td>
</tr>
<tr>
<td>Transaction cost</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Propensity for fraud</td>
<td>High</td>
<td>Low, due to added transparency and robustness</td>
</tr>
<tr>
<td>Mode of confirmation</td>
<td>Manual</td>
<td>Automatically triggered using smart contracts</td>
</tr>
</tbody>
</table>

Smart contracts are self-executing contracts where the terms of the agreement between buyer and seller is directly written into lines of code. The code and the agreements contained therein exist across a distributed, decentralized blockchain network.

Everest Group™ Trade Finance of the Future
### Blockchain Use Cases

<table>
<thead>
<tr>
<th>Use Case</th>
<th>Project</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>To enhance the overall security of trade finance invoicing</td>
<td>IDA</td>
<td>IDA, along with DBS and Standard Chartered Bank, has completed a proof of concept delivering a distributed ledger technology to enhance the security of trade finance invoicing. The intention is for authorities to make the process of trade finance invoicing more secure and easier, both for the companies and lending banks.</td>
</tr>
<tr>
<td>To build an anti-counterfeit solution (for pharmaceuticals) or to ensure the legitimacy of pharmaceutical products</td>
<td>Blockverify</td>
<td>Blockverify is looking to use blockchain in the fight against counterfeit drugs. Currently, the company has been testing solutions in pilot programs with both a Swiss pharmaceutical company that has a UK presence and a London-based beauty company. It hopes to help disable the $1.77 trillion value of the global trade in counterfeit (and pirated) goods projected for 2015 by the IACC.</td>
</tr>
<tr>
<td>Digitization of documents or contracts and proof of ownership for transfer</td>
<td>Colu</td>
<td>Colu uses blockchain to manage property assets through digital tokens that can unlock either online services or physical objects. Using the open-source protocol Colored Coins, Colu lets its users “color” a tiny fraction of a bitcoin with a specific attribute. This links the token to a real-world asset offering cryptographic security and fraud-proof ledger capability. Users can issue and track their digital assets on its platform.</td>
</tr>
<tr>
<td>Using blockchain to combat fraud</td>
<td>Everledger</td>
<td>Everledger is working on a tamperproof digital ledger of the world’s most valuable stones, diamonds. To do this, the company has partnered with different institutions across the diamond pipeline, including insurers, law enforcement and the 10 diamond certification houses across the world. Through Everledger’s API, each of these parties can access and supply data around the status of a stone, including police reports and insurance claims. When a diamond is recovered, this can be a way to help investigators track who owned it and where to return it.</td>
</tr>
<tr>
<td>To enable efficient supply chain authentication</td>
<td>Skuchain</td>
<td>Skuchain is a startup that is creating blockchain-based products for B2B international trade finance and supply chain finance. It is developing solutions to address the $18 trillion global trade finance market that still relies on paper documentation for most processes. Skuchain has development projects underway with multiple international banks, and is supported by investors, including Amino Capital, DCG and Fenbushi Capital. Skuchain's vision is to build a 'commerce cloud' where trade partners can interact friction-free and gain deep visibility into their supply chains.</td>
</tr>
<tr>
<td>Order fulfillment in e-commerce and manufacturing</td>
<td>UbiMS</td>
<td>UbiMS is using blockchain technology to change the way that businesses manage data, adapt to shifting consumer demands and coordinate the flow of goods around the globe. UbiMS is developing a cloud-based metaplatform for the entire physical supply chain process. Just like the Internet, the International Sustainable Campus Network (ISCN) is a metaplatform connecting multiple providers of goods with multiple consumers worldwide. This ecosystem will be constructed with the voluntary participation of many local outsourcing service providers, such as warehouses, distribution and transportation centers, last-mile delivery, and even retailers for local pickup. At its core, the ISCN is designed as a value chain and economic engine for small and midsize enterprises.</td>
</tr>
<tr>
<td>Enabling paperless trade</td>
<td>Wave</td>
<td>Wave has created a P2P and completely decentralized network that connects all carriers, banks, forwards, traders and other parties of the international trading supply chain. It uses decentralized technologies, and all communication between these parties will be direct and will not pass through a specific central entity. Due to its decentralized nature, the Wave network will not have any single point of failure and will not rely on any single entity.</td>
</tr>
<tr>
<td>Supply chain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pharmaceuticals and supply chain</td>
<td></td>
<td></td>
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<tr>
<td>Legal and supply chain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Legal and supply chain</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Examples of evolving e-commerce platforms/marketplaces

<table>
<thead>
<tr>
<th>Focus</th>
<th>Marco Polo</th>
<th>Audr</th>
<th>Voltron</th>
<th>we.trade</th>
<th>Batavia</th>
<th>Wilson</th>
<th>CCRM</th>
<th>HKMA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus</td>
<td>Open account</td>
<td>Open account</td>
<td>Traditional trade finance</td>
<td>Procurement Order to cash</td>
<td>Shipping Logistics</td>
<td>Working Capital optimisation</td>
<td>Secondary market for risk assets</td>
<td>Open account</td>
</tr>
<tr>
<td>Services</td>
<td>Pre-shipment</td>
<td>Post-shipment</td>
<td>Factoring Rec Finance</td>
<td>LCs Digitised docs</td>
<td>SME Finance</td>
<td>Digitised docs Track &amp; Trace</td>
<td>SCF</td>
<td>Asset distribution</td>
</tr>
<tr>
<td>Geography</td>
<td>Global</td>
<td>Nordic</td>
<td>Global</td>
<td>Western Europe</td>
<td>Global</td>
<td>Global</td>
<td>APAC</td>
<td>APAC</td>
</tr>
<tr>
<td>Customer segments</td>
<td>Mid-market SME</td>
<td>SME</td>
<td>SME</td>
<td>Large corporate</td>
<td>Large corporate</td>
<td>Third party investors</td>
<td>SME</td>
<td></td>
</tr>
<tr>
<td>DLT protocol</td>
<td>R3 Corda</td>
<td>R3 Corda</td>
<td>R3 Corda</td>
<td>IBM Fabric</td>
<td>IBM Fabric</td>
<td>none</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td>Technology providers</td>
<td>TradeIX, R3</td>
<td>TradeIX, R3</td>
<td>Bolero, R3, CGI</td>
<td>IBM</td>
<td>IBM</td>
<td>none</td>
<td>Crimson Logic Tin Hill Capital</td>
<td>none</td>
</tr>
<tr>
<td># of banks</td>
<td>14</td>
<td>5</td>
<td>12</td>
<td>7</td>
<td>5</td>
<td>7</td>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td>Bank names</td>
<td>ING, BNP, Commerz, RBS, Wells, BBVA, Barclays, Shinhan, CTBC, Bangkok Bank Bladex, BCP, Natixis, Intesa Sao Paolo</td>
<td>DNB, SEB, Danske, OP, Nordea</td>
<td>BBVA, HSBC, US Bank, Scotia, ING, RBS, Intesa Sao Paolo, Mizuho, SEB</td>
<td>Deutsche, HSBC, KBC, Natixis, Rabo, SocGen, Unicredit</td>
<td>UBS, Commerz, BMO, Caixa, Erste</td>
<td>BNP, StanChart, Citi, Deutsche, ANZ, Santander, HSBC</td>
<td>BOC, DBS, ICICI, SwissRe, Unicredit, ANZ, BAMI, BBVA, BEA, BNP, HSBC, ICBC, MUFG, Mizuho, StanChart, Sumitomo</td>
<td>HSBC, StanChart, DBS, Heng Seng, BEA, BoC</td>
</tr>
</tbody>
</table>
Future Direction and Developments

TODAY

• Inconsistent information across organizational boundaries and “blind spots” throughout the supply chain hinder the efficient flow of goods
• Complex, cumbersome, and costly peer-to-peer messaging
• Manual, time-consuming, paper-based processes
• Risk assessments often lack sufficient information; clearance processes subject to fraud
• The administrative cost of handling a container shipment is comparable to the cost of the actual physical transport

FUTURE

• Fast, secure access to end-to-end supply chain information; single source of the truth
• Verifiable authenticity and immutability of digital documents
• Trusted cross-organizational workflows
• Better risk assessments and fewer unnecessary interventions
• Far lower administrative expenses and elimination of costs to move physical paper across international borders
Top five expected benefits of blockchain in financial services

- Improved data management (47%)
- Greater transparency (46%)
- Improved risk management (40%)
- Increased speed of digitalisation (39%)
- Streamlining of processes (39%)

Top five internal barriers to adoption of blockchain

- Understanding blockchain and use-cases (53%)
- Communicating blockchain to key decision-makers (50%)
- Evaluating cost-benefits of use-cases (50%)
- Uncertainty around time needed to start reaping benefits (43%)
- Other technology investments taking priority (43%)

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1960s
- Semiconductor microprocessors
- Allowed the replacement of physical recording by digital data

1970s
- Mainframes
- Enabled batch processing

1980s
- Terminals and PCs
- Automated banks and branches and facilitated offline remote banking

1990s
- Local networks
- Enabled data centres, intranets and corporate systems

2000s
- Internet
- Facilitated the global exchange of data and enabled a series of international businesses

2010s
- Smart devices
- Created a new medium to interact with clients and collect data

Emerging technologies
- Biometrics
- Cloud computing
- Cognitive computing
- Distributed ledger technology
- Machine learning / predictive analytics
- Quantum computing
- Robotics

DLT is one of many transformative new technologies that will shape future financial services infrastructure and should be seen as part of a toolbox.
The future of digital trade and supply chain finance

New technologies – a selected view

Source: Accenture Research
TRADE INDUSTRY INITIATIVES

E-enabling the rules

In June 2017 the ICC Banking Commission launched a working group to coordinate all work relating to the digitalisation of trade finance. The group aims to help the trade finance industry accelerate its progress towards greater digitalisation.

The working group’s core activities are threefold:

(1) “E-compatibility” of ICC rules for trade finance
The group will evaluate ICC rules in order to assess e-compatibility and ensure they are ‘e-compliant’. This will enable banks to accept data rather than documents.

(2) Standards
In order to remove uncertainty in the industry and accelerate the uptake of digitalisation, the group will develop a set of minimum standards for the digital connectivity of service providers – particularly across legal, liability, information security and technology.

(3) Legal status
The group will examine the legal and practical issues related to the validity and value of data and documents in digitised form e.g. how the rights of third parties compare under paper and electronic Bills of Lading (eB/Ls).
Digital Standards for Trade (DST) is a World Trade Board initiative. DST was launched in January 2018 to help drive digitisation and greater interoperability in the trade ecosystem through the adoption of common standards. DST is specifically addressing five major constraints:

- Data security
- Transfer of liability
- Acceptability of electronic documents
- Standards and data for KYC/AML
- Interoperability across blockchain /DLT platforms

DST Deliverables
- Analytical mappings of existing standards in FTAs, ISO, ESCAP, UNCITRAL, UNCEFACT, etc.
- Minimum standards adoption by key stakeholders
- Pilots of soft mandates to incentivise market participants to adopt common standards
- Recommendations to increase efficiencies and reduce market participants’ liabilities e.g. common government-backed KYC registry
- Capacity-building programs, technical assistance & loans for developing country governments, banks, SMEs to digitise and adopt common standards

World Trade Board members
Simon Paris, Deputy CEO, Finastra and Co-chair, World Trade Board
David Hennah, Head of Trade and Supply Chain Finance, Finastra. Co-chair, World Trade Board
Sir Vince Cable, former UK Secretary of State for Business Innovation and Skills and President, Board of Trade
Pascal Lamy, President emeritus, Jacques Delors Institute; former DG, World Trade Organisation
Ken Ash, Director of Trade and Agriculture, OECD
Steven Beck, Head of Trade Finance, Asian Development Bank
Enrico Camerinelli, Senior Analyst, Aite Group
John Danilovich, former Secretary General, International Chamber of Commerce (ICC)
Shawn Donnan, World Trade Editor, Financial Times
Jonathan Fried, Coordinator, International Economic Relations, Global Affairs, Canada
Michael Gidney, CEO, Fairtrade Foundation
Arancha Gonzalez, Executive Director, International Trade Centre
Anabel Gonzalez, Senior Director, Trade and Competitiveness Global Practice, World Bank Group
Gerard Hartsink, Chairman, GLEIF (Global Legal Entity Identifier Foundation) Board
Prof. Dr. Michael Henke, Director of Enterprise Logistics, Fraunhofer Institute for Material Flow and Logistics (IML)
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Elliott Limb, Founder, CoBa
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Gerald Sun (Mastercard)
Thank you