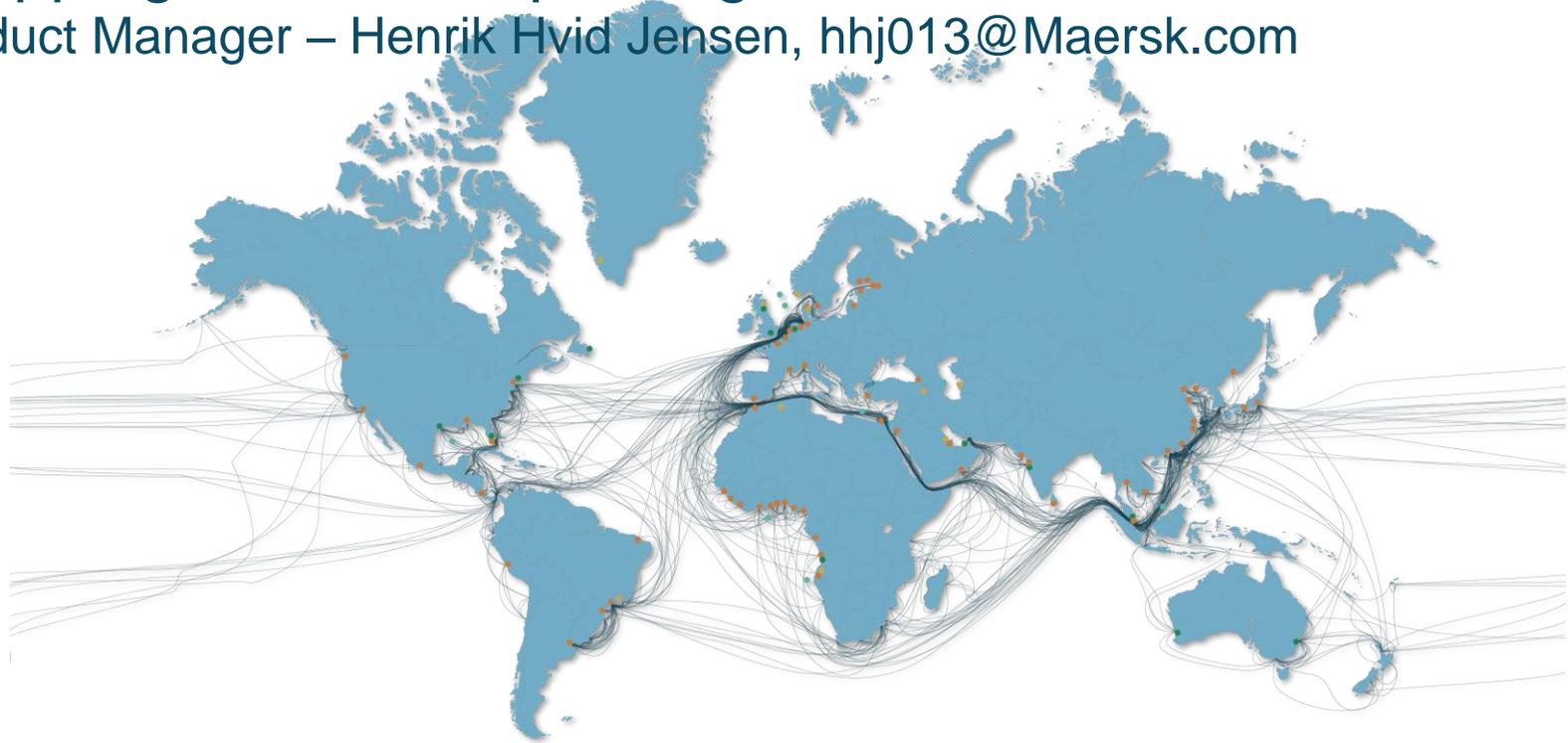


Open global trade digitization platform

iShipping Forum –Copenhagen 27-28 Feb 2018

Product Manager – Henrik Hvid Jensen, hhj013@Maersk.com



MAERSK

February 2018

On January 16, IBM and Maersk announced plans to form a joint venture to improve global trade and digitize supply chains

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Maersk and IBM to Form Joint Venture Applying Blockchain to Improve Global Trade and Digitize Supply Chains

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COPENHAGEN, DENMARK and ARMONK, NY - 16 Jan 2018: A.P. Moller – Maersk (MAERSKb.CO) and IBM (NYSE: [IBM](#)) today announced their intent to establish a joint venture to provide more efficient and secure methods for conducting global trade using blockchain technology.



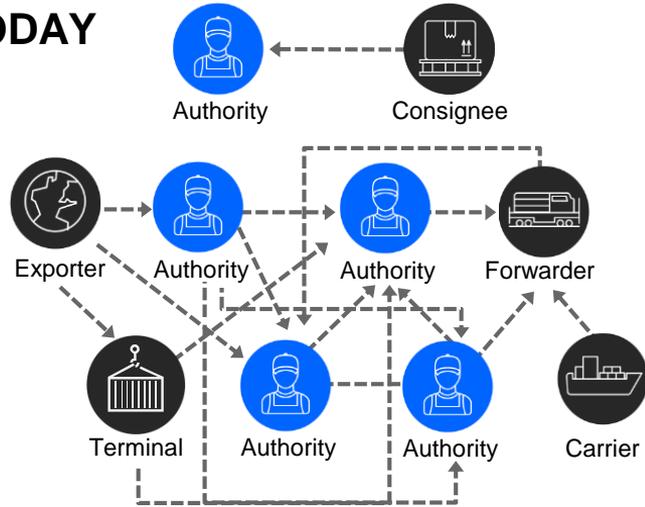
The establishment of the joint venture remain subject to receipt of regulatory approvals. None of the information provided in this document should be construed in any way as a representation or undertaking with regard to the position to be adopted by Maersk or IBM.

Agenda

- Why the need for Global Trade Digitization?
- GTD Component 1: Shipping Information Pipeline
- Digital trends guiding design of Global Trade Digitization – Prepare for tomorrow while remaining relevant today
 - Digital business shift focus to Ecosystem optimization
 - Digital Ecosystem Platforms
 - Event Thinking
 - The API-Economy
 - Programmable Economy (blockchain)
- Blockchain in Global Supply Chains
- GTD Component 2: Paperless Trade

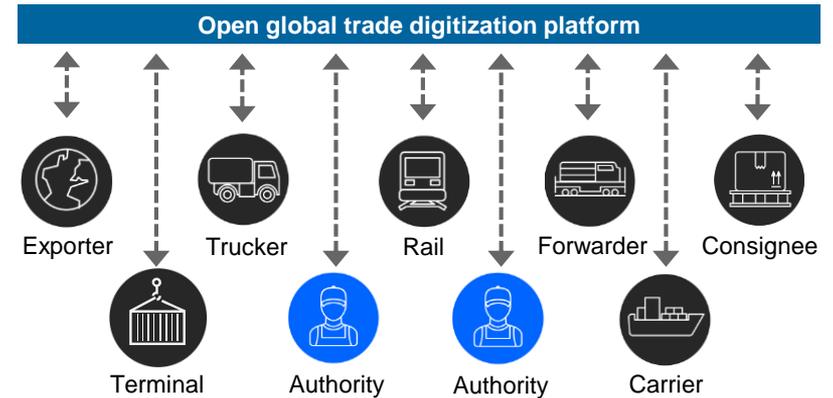
The case for a better way

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

TOMORROW



- Instant, secure access to end-to-end supply chain information - single source of the truth
- Assurance of the authenticity and immutability of digital documents
- Trusted cross-organizational workflows
- Supply chain documents remains under the control of the source – No shared document database
- Complimentary not substitutional to existing SCM/TMS-solutions - Everyone keeps their existing IT-system
- As neutral as the Internet – Shaped by the ecosystem

Reducing global trade barriers and increasing efficiency across international supply chains

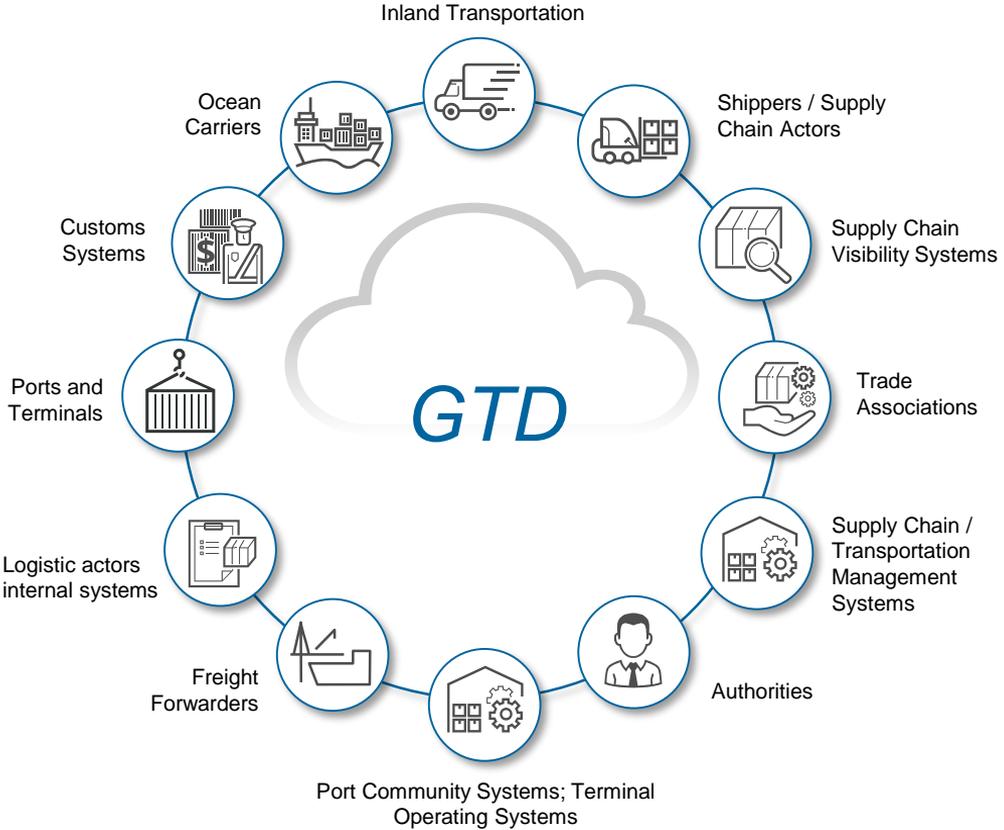
Bringing to market an ecosystem platform for containerized shipping connecting the entire supply chain ecosystem

1 Shipping information pipeline

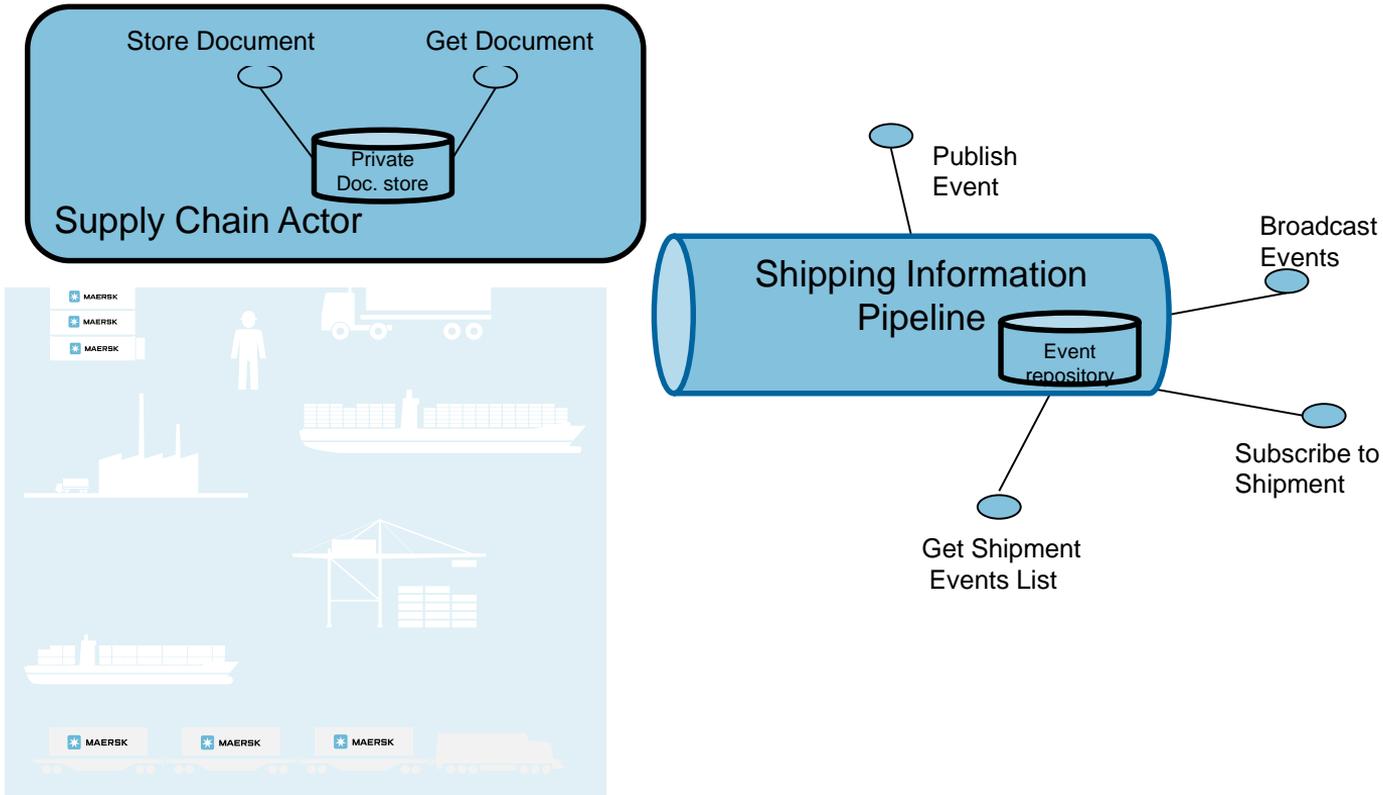
Will provide **end-to-end supply chain visibility** that enables all actors involved in a global shipping transaction to securely and seamlessly exchange shipment events in real time

2 Paperless trade

Will **digitize and automate paperwork filings** for the import and export of goods by enabling end users to securely submit, stamp and approve documents across national and organizational boundaries

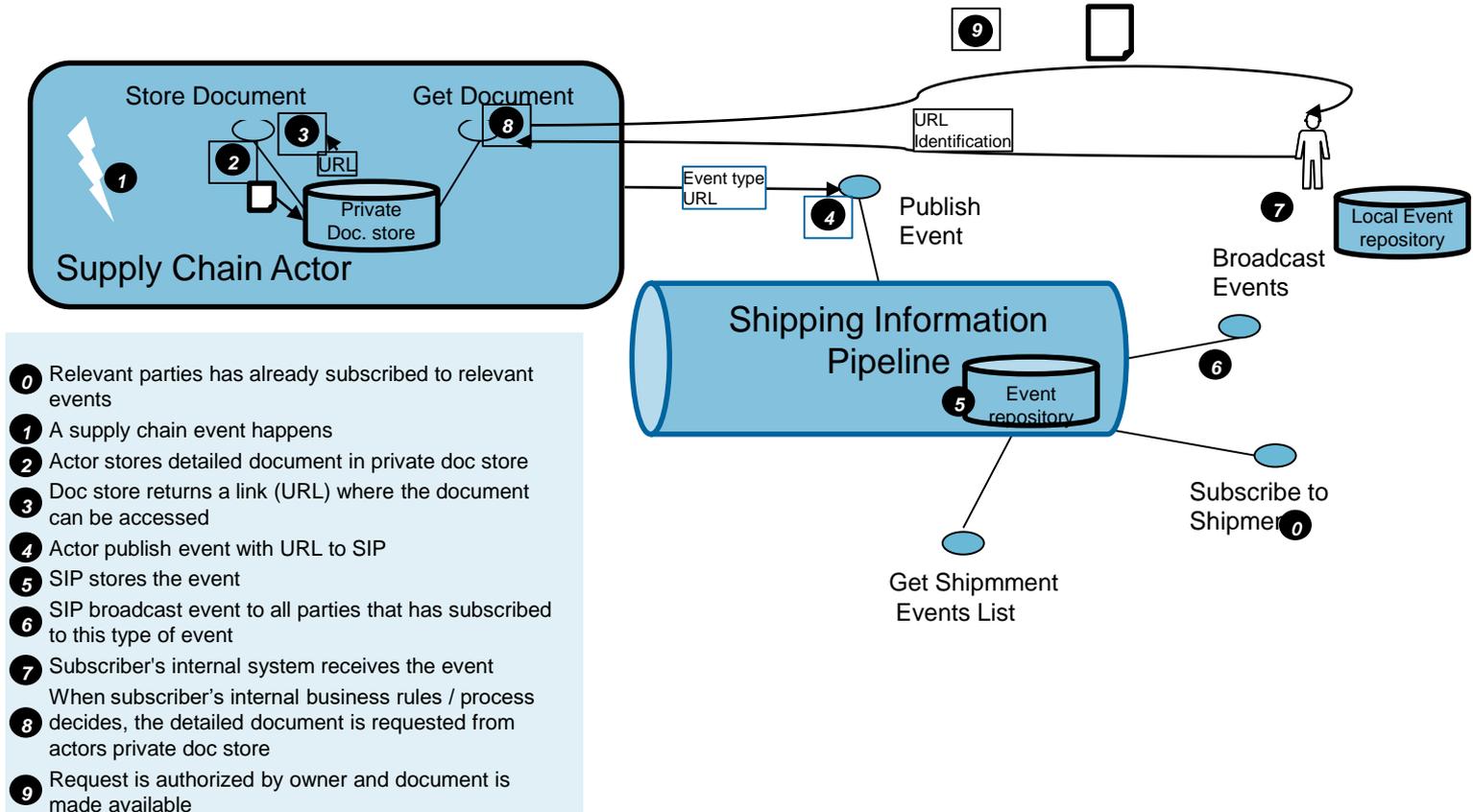


How does the Shipping Information Pipeline work?



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How does the Shipping Information Pipeline work?



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Shifting focus from EGOsystem optimization



"Mine"



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Towards Business Ecosystem optimization



"Mine"



"Ours"



"The conventional wisdom is that competition in the future will not be company vs. company but supply chain vs. supply chain."

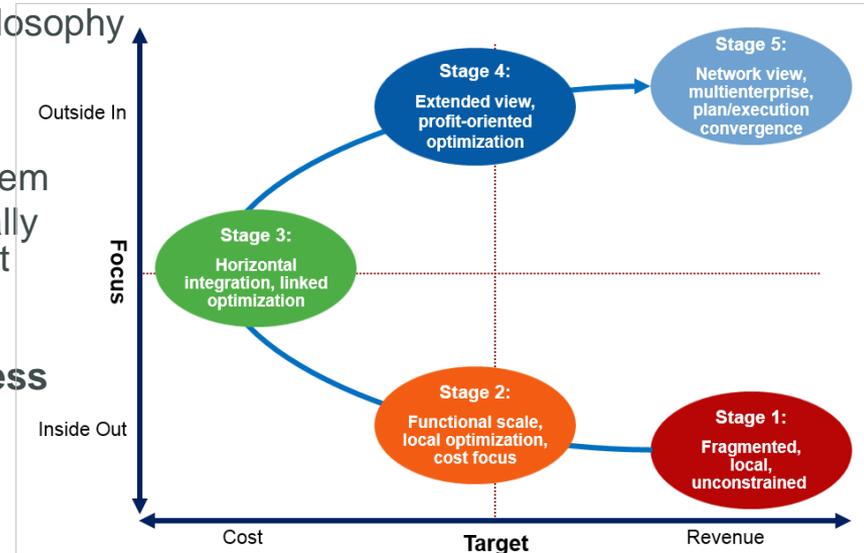
James Blayney Rice, MIT



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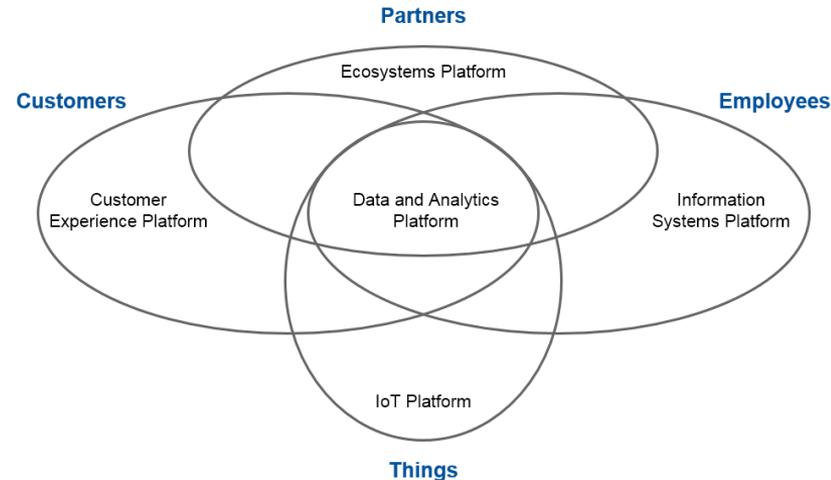
GTD will be a critical component in the supply chain ecosystems in the age of digital business

- Digital business will be having a profound impact on shifting the focus to business ecosystems.
 - The next wave of innovation will come from **turning attention outward** into the business ecosystem
 - A business ecosystem enables various parties to **expose their capabilities and leverage the capabilities** of others, driving higher levels of business value
- Optimizing the business ecosystem is the central philosophy behind GTD,
 - Giving **everyone in the ecosystem access** to the information needed to make the right decisions to the benefit of the complete ecosystem
 - Allow any container transports ecosystem globally to **be adjusted fluidly and dynamically** without compromising the quality and timeliness of information received.
 - **Mitigate the increased complexity the business ecosystem** will face as number of interconnections increase dramatically.



Digital Ecosystem Platforms

- Allows a community of partners, providers and customers to share and enhance digital processes and capabilities
 - Enable **interactions across the digital ecosystem**.
 - Underpin the **creation of new business models** by integrating ecosystems.
 - A stable base of IT services — modular and service-oriented — that **brings together the organization's own systems and contributions from outsourcers and "as a service" providers**.
- GTD the Digital Ecosystem Platform for Logistics
 - Designed to **digitally connect any actors** in the transportation ecosystem
 - Enabling any number of actors to be **dynamically added to** or removed from your eco-system,
 - While still receiving **same quality of consistent information** digitally and in real time.

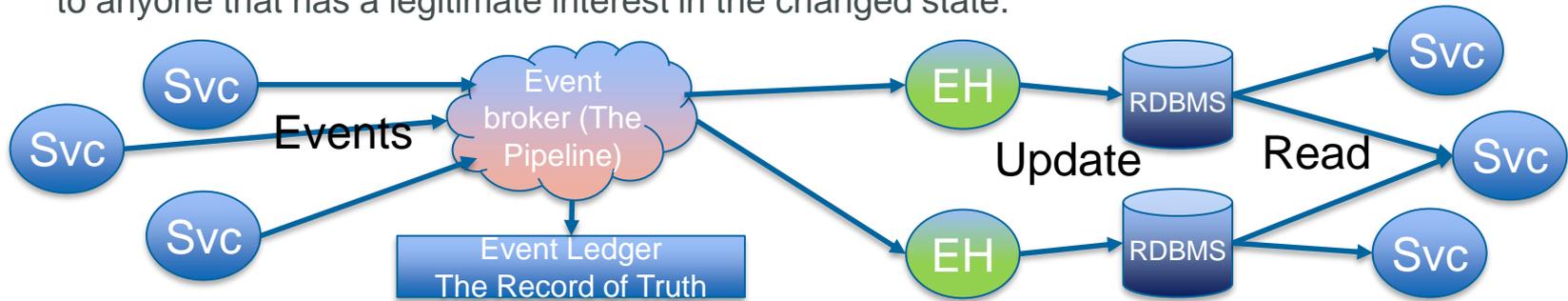


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Event Thinking - From IGWIWWYSI to IWWIWWIWI – I Want What I Want When I Want It

- An event represents a **change or measure of a monitored state** (Anything that happens)
 - Event producers detect events and publish them to a channel where zero or more event consumers listen for those events on the channel.
 - Event producers and consumers share nothing other than access to the channel and a common understanding of the event object.
- A key distinction of a digital business is that it's **event-centric**,
 - It's always sensing, always ready, always learning and always changing
- **Event Thinking is the foundation** of The Shipping Information Pipeline
 - Every time something relevant happens an event is sent from the actor making the state change to anyone that has a legitimate interest in the changed state.



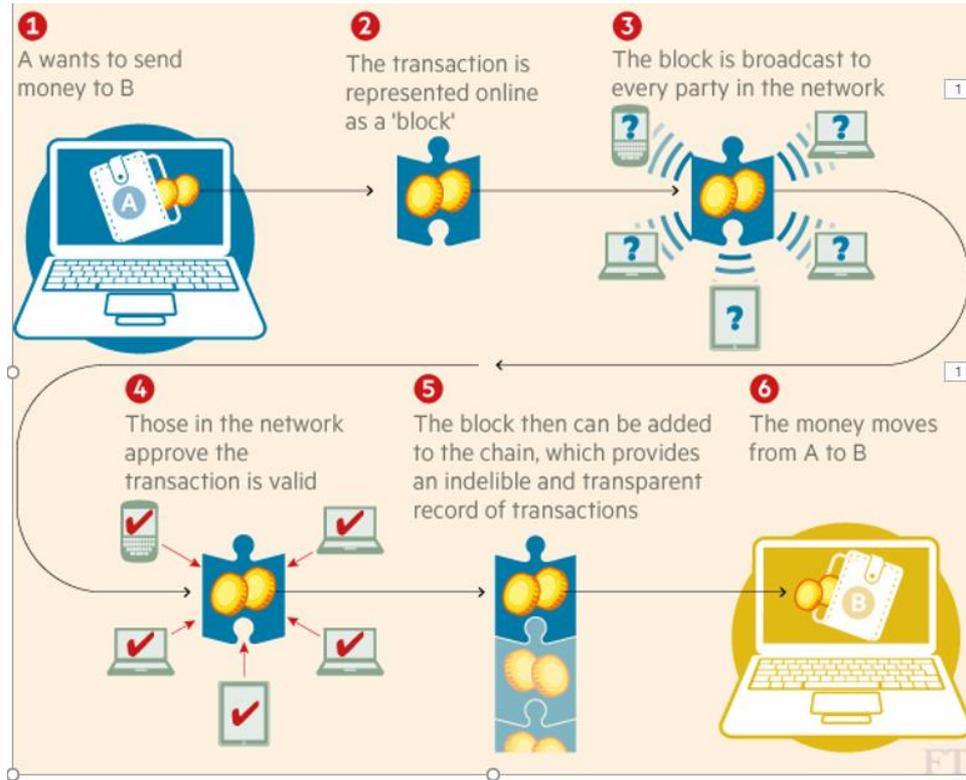
The API-Economy

- The API economy is about **systems talking to systems**
 - Access to functionality is through an application programming interface (API).
 - The **window to the world is the API's** not the user interface
- The only way to communicate with SIP is via APIs.
- **Value Adding Services (VAS)** will be microservices offered on the SIP Platform that will only be accessible via APIs.
 - Build Once – Used Everywhere by Everyone
 - **Prevents everyone from building the same generic functionality** thereby taking cost out of the supply chain and harmonizing the way the ecosystem collaborates.

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 - Programmable Economy (blockchain)
- **Blockchain in Global Supply Chains**
- GTD Component 2: Paperless Trade

How a blockchain works



- A shared, immutable ledger for recording the history of transactions that establish trust, accountability and transparency.
- The distributed ledger is an authoritative record created in an untrusted, decentralized environment without reliance on a central authority, server or data center.

Different ways to handle trust

- Today: Individual ledger - Each party keep their own ledger
 - You trust known parties and the transactions that happens between you is stored in your individual controlled ledger
 - In case of dispute there is no independent middleman that can document the transactions, it depends on the records in each parties ledger



- Today: Centralised Ledger - A middleman trusted by both parties bridge trust between parties unknown to each other
 - Each transaction is stored in each parties individual controlled ledger as well as with the middleman
 - In case of dispute the independent middleman can document the transactions
 - The middleman is paid for his involvement and controls the value chain



Blockchain: Distributed ledger - Independent blockchain nodes verifies legitimacy of transaction and store the transaction in a shared immutable ledger

- No need to store transaction in your own ledger as the ledger is immutable
- In case of dispute there is one version of the truth in the shared ledger
- The nodes will be paid but it is expected to be less than the middleman
- Not a central entity that controls the value chain
- What I see is what you see



Where is blockchain applicable

- Blockchain is most suited to business ecosystems which
 - Have a decentralized peer-to-peer structure of relationships
 - There is a dynamic collection of parties who don't trust each other but need to do business with each other and where there is no central authority.
- Typical use cases within the next 5 years
 - Exchange ownership of digitized assets
 - Shared confirmation that a transaction has taken place and shared reflection of the consequences of such a transaction
 - Starting to see trusted third parties value proposition diminish
- The end result of the blockchain-driven disruption will be the "programmable economy".
 - Distributed autonomous agents with imbued purpose via embedded rules and business logic.
 - Agents will negotiate with each other, negotiate self-enforcing contracts

Blockchain in global supply chain

- Critical events relating to the progress of goods through the supply chain are recorded to the blockchain, creating an immutable record that can be used for:
 - **Trade finance** — Bills of lading/letters of credit, trade payments, etc. -
 - **Multienterprise/party product traceability** — (in e.g. healthcare to fight against counterfeit/fake drugs)
 - **Insurance** - Key shipping documents and events are recorded to the blockchain to reduce costs associated with underwriting insurance policies and adjusting insurance claims.
 - **Smart contracts** — Where contracts, or contractual terms, between parties are stored on a blockchain that autonomously executes under certain conditions.
 - **Shipping Dispute Resolution** – Who to blame when a container are “rolled”
- GTD’s Paperless Trade
 - Immutable storage of import/export documentation together with authorities signatures and the workflow used to produce the documentation

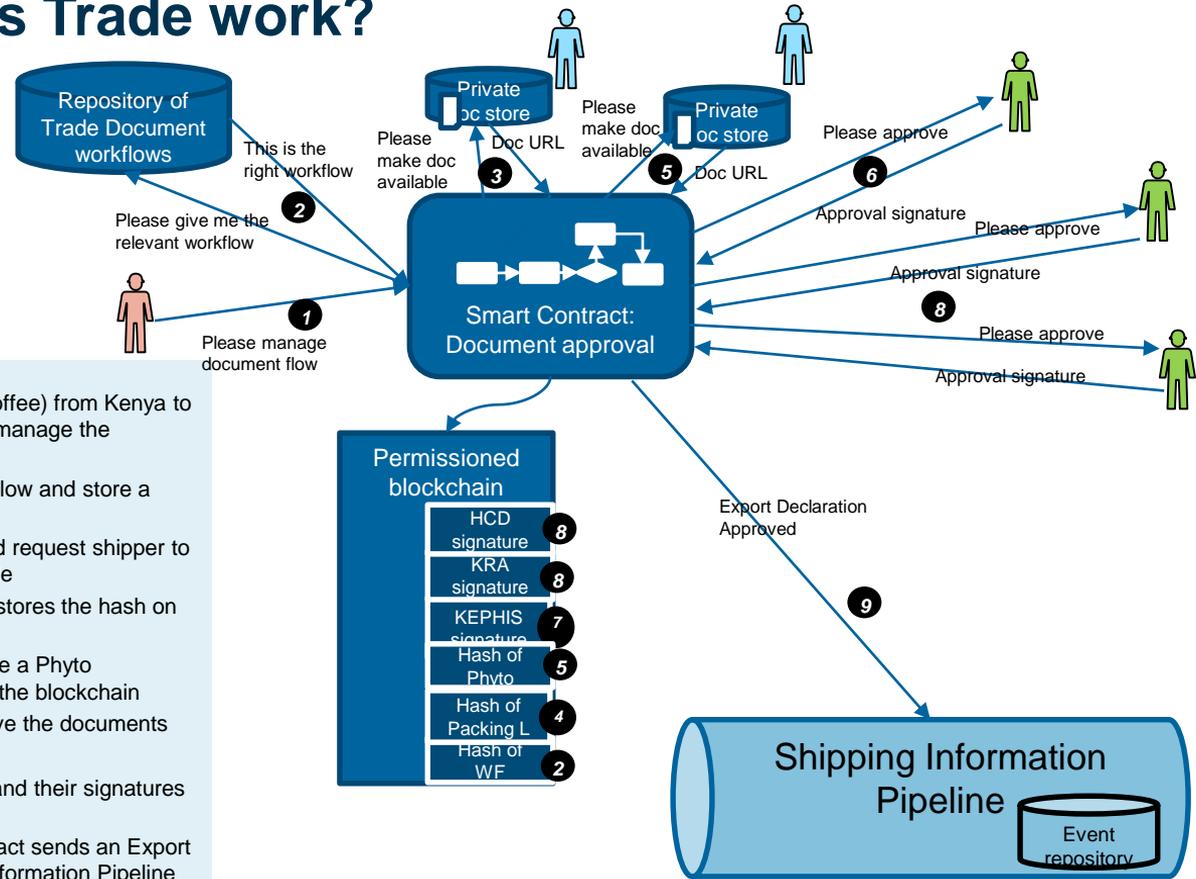
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How does Paperless Trade work?

Transparency for permissioned actors

- Document workflows are visible
- Smart contract code is visible
- Blockchain is visible



- 1 Coffee Ltd wants to transport a commodity (Coffee) from Kenya to The Netherland and asks Paperless Trade to manage the document workflow
- 2 The Smart Contract request the relevant workflow and store a hash of the workflow on the blockchain
- 3 The Smart Contract executes the workflow and request shipper to make a document (e.g. packing list) available
- 4 The Smart Contract hash the packing list and stores the hash on the blockchain
- 5 The Smart Contract request Inspection to make a Phytosanitary document available and the hash is stored on the blockchain
- 6 The Smart Contract request KEPHIS to approve the documents
- 7 KEPHIS' signature is stored on the blockchain
- 8 KRA and HCD also approves the documents and their signatures are stored on the blockchain
- 9 When everything is approved the Smart Contract sends an Export Declaration Approved event to the Shipping Information Pipeline



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Key take aways

1. Global Trade Digitization will be the infrastructure underpinning complete digitization of events, documents and cross organizational collaboration
2. Designed to optimize digital eco-system collaboration . The next wave of innovation
3. Event Thinking and API-economy facilitates IWWIWWIWI – I Want What I Want When I Want It
4. Blockchain technology has the potential to transform the supply chain because the distributed ledger could unify previously fragmented flows of money, goods, information and digital assets.

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