TRADELENS
and the 4th industrial revolution

Lima, October 2019
The 4th industrial revolution

The 1st industrial revolution began in the 18th century with water and steam power

The 2nd with electricity

The 3rd beginning of the third with the internet

The past few decades we have been living in the third industrial revolution in technological development.

The technologies driving the fourth industrial revolution are still in their infancy, but they are here to stay.
How the 4th industrial revolution impact the shipping industry

+ The shipping industry has introduced digital innovations at a slower pace than some other industries. This slower rate of digital adoption could be potentially catastrophic for even the biggest established players in the business.

+ The shipping industry is still suffering from some very significant inefficiencies. 50% of trucks travel empty on their return journey after making a delivery.

+ Digital transformation can bring important social and environmental benefits by increasing efficiency and support cutting down energy consumption and CO2 emissions.
How Blockchain is driving the 4th industrial revolution

The “fourth industrial revolution” has been described by the World Economic Forum as a new era of technology and industry. A trinity of disruptive technologies is driving this revolution:

+ Blockchain

+ Internet of things

+ Artificial intelligence
TradeLens is ushering in a new era in global supply chains—one where all parties can collaborate, share data, and realize the benefits of digitization.

Data is published directly from the source so the right people can securely manage their supply chain in near real-time.

TradeLens breaks down longstanding data and processing silos that exist among trading partners and simplifies the flow of documentation that accompanies every shipment.

Currently, the platform handles 13 million events and more than 100,000 documents every week and growing.

The platform is being driven by a broad collaboration of industry players under the leadership of IBM and Maersk.

GLOBAL TRADE IN NUMBERS

$16+ TRILLION IN GOODS ARE SHIPPED ACROSS INTERNATIONAL BORDERS EACH YEAR

80% OF THE GOODS CONSUMERS USE DAILY ARE CARRIED BY THE OCEAN SHIPPING INDUSTRY

BY REDUCING BARRIERS WITHIN THE INTERNATIONAL SUPPLY CHAIN, GLOBAL TRADE COULD INCREASE BY NEARLY 15%
GLOBAL TRADE IS HIGHLY INEFFICIENT AND BURDENED BY PAPER-BASED PROCESSES

+ Data trapped in organizational silos
  Information is held in paper and various digital formats across dozens of service providers along the supply chain, requiring complex, cumbersome, and costly peer-to-peer messaging. The result is inconsistent information across organizational boundaries, latency in obtaining shipment visibility, and blind spots that hinder the efficient flow of goods.

+ Manual, time-consuming, paper-based processes
  The collection and processing of up-to-date data, as well as inefficient trade document exchange, requires manual checks and frequent follow-ups and results in errors, delays and high compliance costs. Late filings are common due to missing information.

+ Clearance takes too long and is often subject to fraud
  Risk assessments by customs authorities lack sufficient and trusted information resulting in high inspection rates, added prevention measures against fraud and forgery, and delayed customs clearance.

+ High costs and poor customer service
  These challenges have significant downstream repercussions. The inability to forecast and plan effectively, address supply chain disruptions in near real-time, and share trusted information across the supply chain leads to excessive safety stock inventory, high administrative costs, operational challenges, and ultimately poor customer service.
OUR MISSION

DIGITIZE THE GLOBAL SUPPLY CHAIN

+ **Connect the ecosystem**
  Bring together all parties in the supply chain - including shippers, freight forwarders, intermodal operators, ports and terminals, ocean carriers, customs and other government authorities, and others - onto a blockchain-based platform with a secure permission and identity framework.

+ **Drive true information sharing**
  Provide for the seamless, secure sharing of near real-time, actionable supply chain information across all parties to a trade - encompassing shipping milestones, cargo details, trade documents, the structured data embedded in trade documents, customs filings, sensor readings, and more.

+ **Foster collaboration and trust**
  Enable the digitization and automation of the cross-organization business processes integral to global trade, including import and export clearance, with blockchain ensuring secure, auditable, and non-repudiable transactions.

+ **Spur innovation**
  Lay the foundation for ongoing improvement and innovation through an open, publicly-available API, the use of standards and promotion of interoperability, and the launch of an Application Marketplace that parties can use to build and deploy TradeLens-powered applications for themselves, their partners, and their customers.
**Overview**

**TradeLens Overview**

**Introduction**

29 October, 2019

---

**Shipping Milestones and Shipment Data**

- Start Container Packaging (or booking; confirmed)
- Empty container Delivered to depot
- Container loading completed at billed location
- Container selected for inspection
- Container Landed/Loaded on vessel
- Vessel Departure Estimated/Actual
- Vessel Arrival Estimated/Actual
- Discharged at import terminal (planned/actual/delivered)
- Carrier release
- Import Customs release
- Gate Out for container (planned/actual/delivered)
- Carrier stripped
- Empty container Delivered to destination terminal

---

**Structured and Unstructured Documents**

- Packing List
- Original Bill of Lading
- Non-Negotiable Bill of Lading
- Advance Declaration
- Pre-Paid Invoice
- Certificate of Origin
- Shipping Instructions
- Importer Security Filing
- Cargo Specific Certificate
- Customs Clearance
- Commercial Invoice
- Export Documentation
- Import Documentation

---

**TradeLens Blockchain Business Network**

*Note: representative sample only of the data on the platform*
Data that are precise and accessible to all parties help shipments move faster. TradeLens provides a near real-time publish and subscribe mechanism for exchanging milestone data between the entities that are involved in the shipment.

Importers and exporters who use TradeLens can easily determine the status of their shipments through access to more than 120 shipment event types, communicated directly from the source, including document updates and planned, estimated and actual transport milestones.

---

**Planned**
- Planned stuffing start
- Planned stuffing completed
- Planned loaded on truck
- Planned gate out
- Planned gate in
- Planned discharge from truck
- More...

**Estimated**
- Estimated rail arrival
- Estimated discharge from rail
- Estimated loaded on barge
- Estimated barge departure
- Estimated barge arrival
- Estimated discharge from barge
- More...

**Actual**
- Actual loaded on vessel
- Actual vessel departure
- Actual vessel arrival
- Actual discharge from vessel
- Actual stripping start
- Actual container stripped
- More...
TradeLens provides a framework for sharing documents among trade parties, with security, version control, and privacy. Authorized users with the required permissions can upload, download, view and edit documents. The TradeLens document store allows documents to be securely stored and viewed by various parties to a shipment.

**Digitized document benefits**

- Trade documents are associated with containers, and consignments in a distributed and shared repository, eliminating endless file, folder and email searching for information.

- TradeLens supports the use of structured documents. The information they contain can be easily analyzed and interpreted, allowing for greater automation and accuracy.

- Each time a document is edited or uploaded to the TradeLens platform, a new version of the document is created and added to the document store, eliminating multiple copies and the inconsistency of identifying the latest versions.

- TradeLens uses the Hyperledger Fabric permissioned blockchain to guarantee the immutability and traceability of trade documents.

- Participants assigned to the consignment have default access rights based on a unified permissions model.

- Network participants assigned to a consignment can immediately access shared documents and data, never having to wait for a document to be sent.

**DOCUMENTS SUPPORTED ON THE PLATFORM**

- Sea Waybill*
- Commercial Invoice *
- Packing List *
- Booking Request
- Booking Confirmation
- Shipping Instructions
- Export Declaration
- Bill of Lading
- Pro-Forma Invoice
- Arrival Notice
- Import Declaration
- Health Certificate
- Phytosanitary Certificate
- Veterinary Certificate
- Fumigation Certificate
- Inspection Certificate
- Certificate of Analysis
- Certificate of Origin
- Dangerous Goods Declaration

* Structured support
The foundation of TradeLens is its business network — shippers, freight forwarders, ports and terminals, ocean carriers, intermodal operators, government authorities, customs brokers and more. Each entity shares information that can be tracked, stored and actioned across the platform throughout a shipment’s journey.

The TradeLens Platform is accessible via an open API and brings together the ecosystem through a set of open standards. Powered by Hyperledger Fabric blockchain technology and IBM Cloud, the platform enables the industry to share information and collaborate securely.

An open Applications and Services Marketplace allows both TradeLens and third parties to publish fit-for-purpose services atop the TradeLens platform, fostering supply chain innovation and value creation.
THE TRADELENS ECOSYSTEM
TradeLens Overview

The TradeLens Ecosystem

29 October, 2019

ECOSYSTEM PARTICIPANTS

NETWORK MEMBERS

Ocean Carriers
Provide the transportation plan, information about the status of shipments across the ocean leg, and critical documents such as the BoL; access end-to-end supply chain data in near real-time including events directly from shipper, intermodal, customs and 3PLs

Ports / Terminal Operators
Provide information about the disposition of cargo within the boundaries of the port/terminal; access near real-time information to enrich port collaboration and improve terminal planning

Intermodal Operators
Provide transportation plans and information on the disposition of shipments carried on trucks, rail, barges, etc.; improve planning and utilization of assets given near real-time access to end-to-end supply chain events for shipments

Government Authorities
Provide information about the export and import clearance status for shipments into and out of the country; access end-to-end supply chain information for improved customs clearance and risk assessments

TRADELENS CLIENTS

Shippers/BCOs
Engage with the platform as a consumer of shipping information to improve supply chain management, as a means to collaborate with supply chain partners, and as a way to streamline clearance

Freight Forwarders / 3PLs
Engage with the platform as a consumer of shipping information, a means to collaborate with customers and supply chain partners, and a way to improve customs brokerage capabilities

Financial Services
Engage with the platform as a consumer of supply chain information for a variety of trade finance, insurance, and other purposes to reduce the risk of fraud and increase speed and flexibility to customers
The ocean leg is at the heart of a container shipment journey, and as such carriers are the linchpin of the end-to-end information model by providing the booking that links all parts of the journey.

Given the central role that carriers play today in safeguarding and distributing key information and documents across parties to a shipment, they are in a unique position to govern the blockchain network that will transform the industry’s information-sharing model.

TradeLens is currently in partnership with 17 global ocean carriers*.

---

* CMA CGM, MSC, Hapag-Lloyd and ONE have agreed to join TradeLens; final on-boarding pending. Speak with your TradeLens representative for a report on current onboarding status.
GOVERNMENT AUTHORITIES

5 CUSTOMS SIGNED/ONBOARDING
10 CUSTOMS ENGAGED / TESTING
8 TERMINALS SENDING CUSTOMS RELEASE

Countries Signed / Onboarding
- Azerbaijan
- Indonesia
- Bahrain
- Saudi Arabia
- Thailand

Countries Engaged / Testing
- Abu Dhabi
- Canada
- Peru
- Chile
- Netherlands
- China
- USA
- Malaysia
- Jordan
- Russia

Terminals Sending Customs Release
- New Zealand / Port of Tauranga
- New Zealand / Port of Auckland
- Korea / KLNET*
- Australia / Patrick Terminals**
- Denmark / APMT Aarhus
- Great Britain / MCP***
- Spain / Port of Algeciras
- USA / Port of Virginia
PORTS AND TERMINALS

Port communities and terminal operators are seeking ways to reduce the cost of connecting partners in the supply chain in order to increase stack placement efficiency and optimize truck and vessel service times.

TradeLens is focused on maximizing the value of these participants by:

+ Reducing the cost of connecting to shipping lines and the broader port community by leveraging an industry standard platform participants are already connected to
+ Simplifying conversational electronic communications of ETAs for all port community participants improves utilization of port assets
+ Enabling advanced communication on aggregated booking volumes and next mode of transport provides better data for stack placement decisions, leading to better truck and vessel service times

* This list of ports and terminal operators is not exhaustive. Speak with your TradeLens representative for a complete list, along with current onboarding status.
PORTS AND TERMINALS STATUS LATIN AMERICA

11 TERMINALS LIVE IN LAM
8 TERMINALS ONBOARDING

<table>
<thead>
<tr>
<th>Terminal Name</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>APM Terminals in Callao Port</td>
<td>Live</td>
</tr>
<tr>
<td>APM Terminals Lazaro Cardenas</td>
<td>Live</td>
</tr>
<tr>
<td>Buenos Aires, Terminal 4</td>
<td>Live</td>
</tr>
<tr>
<td>Cartagena Container Terminal Operator S.A.S. (CCTO)</td>
<td>Live</td>
</tr>
<tr>
<td>Itajai, Porto de Itajai</td>
<td>Live</td>
</tr>
<tr>
<td>Montecor Montevideo</td>
<td>Live</td>
</tr>
<tr>
<td>Pecem Port of</td>
<td>Live</td>
</tr>
<tr>
<td>San Vincente Trm Int. (SVTI)</td>
<td>Live</td>
</tr>
<tr>
<td>TCBUEN</td>
<td>Live</td>
</tr>
<tr>
<td>Terminal de Contenedores Quetzal</td>
<td>Live</td>
</tr>
<tr>
<td>Terminal Puerto Arica (TPA)</td>
<td>Live</td>
</tr>
<tr>
<td>Valparaiso Terminal</td>
<td>Live</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Terminal Name</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iquique Terminal Int. (ITI)</td>
<td>Onboarding</td>
</tr>
<tr>
<td>Manzanillo Terminal</td>
<td>Onboarding</td>
</tr>
<tr>
<td>Manzanillo, Mexico (SSA)</td>
<td>Onboarding</td>
</tr>
<tr>
<td>San Antonio Terminal Int. (STI)</td>
<td>Onboarding</td>
</tr>
<tr>
<td>Santa Marta Terminal</td>
<td>Onboarding</td>
</tr>
<tr>
<td>Santos, Santos Brasil Terminal</td>
<td>Onboarding</td>
</tr>
<tr>
<td>Balboa Port Terminal</td>
<td>Onboarding</td>
</tr>
<tr>
<td>Brasil Terminal Portuario</td>
<td>Onboarding</td>
</tr>
<tr>
<td>Terminal Zarate SA</td>
<td>Onboarding</td>
</tr>
</tbody>
</table>
THE TRADELENS PORT AND TERMINAL NETWORK

- Coverage across 6 continents
- 70 ports and terminals directly integrated with TradeLens
- Data from up to 600 ports and terminals captured by existing TradeLens members

- Ports and terminals directly integrated with TradeLens
- Ports and terminals contributing data via carriers to TradeLens

Interactive map of TradeLens port and terminal network:
https://www.tradelens.com/ecosystem/
THE TRADELENS PLATFORM
The TradeLens blockchain is a shared, immutable ledger that records transactions and tracks tangible and intangible assets. Virtually anything of value can be tracked and traded on a blockchain network, reducing risk and cutting costs for all involved.

While the power of TradeLens comes from its members, blockchain enables secure distribution and storage of vital information at the heart of the platform.

TradeLens uses the IBM Blockchain Platform which is based on Hyperledger Fabric, an open-source permissioned blockchain where the peer members (“Trust Anchors”) are known to the network based on cryptographic identities.

How the TradeLens blockchain connects the ecosystem:

- **Tamper-proof recording and non-repudiation** for all data submitted to the solution.
- **Verifiability** of data against the recorded proof of submission on the blockchain.
- **Recoverability** of the solution from the data recorded on the blockchain.
- **Provenance and Auditability**. All transactions are signed and dated on the ledger.
- **Privacy** of data to ensure that it is only shared with relevant organizations.
# DATA SHARING

TradeLens permissions are determined through a combination of the organization's role and the data type. The TradeLens platform then permits access to data according to the permission matrix.

The full Data Sharing Specification is available [here](#).

<table>
<thead>
<tr>
<th>Events</th>
<th>Transport Service Buyer</th>
<th>Consignor</th>
<th>Consignee</th>
<th>Origin 3PL Agent</th>
<th>Destination 3PL Agent</th>
<th>Export Customs Broker</th>
<th>Import Customs Broker</th>
<th>Request Party</th>
<th>Notify Party</th>
<th>Transport Service Provider</th>
<th>Origin Marine Terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planned stuffing start</td>
<td></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Planned stuffing completed</td>
<td></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Actual loaded on truck</td>
<td></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Estimated gate out</td>
<td></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Actual gate in</td>
<td></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td></td>
<td></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

### Documents

| Booking Confirmation          | ○                       | ○         | ○         | ○                | ○                     | ○                    | ○                    | ○              | ○           | ○                          | ○                     |
| Shipping Instructions         | ○                       | ○         | ○         | ○                | ○                     | ○                    | ○                    | ○              | ○           | ○                          | ○                     |
| Bill of Lading                | ○                       | ○         | ○         | ○                | ○                     | ○                    | ○                    | ○              | ○           | ○                          | ○                     |
| Sea Waybill                   | ○                       | ○         | ○         | ○                | ○                     | ○                    | ○                    | ○              | ○           | ○                          | ○                     |
| House Bill of Lading          | ○                       | ○         | ○         | ○                | ○                     | ○                    | ○                    | ○              | ○           | ○                          | ○                     |

- ○ Participant has an obligation to provide (publish) the data, where relevant/applicable
- ○ Participant has read access (can subscribe) to the data
- ○ Participant has no access to the data
THANK YOU