

SOLUTION BRIEF

EDITION TWO

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WHAT IS TRADELENS?

TradeLens is an open and neutral supply chain platform underpinned by blockchain technology. We are enabling true information sharing and collaboration across supply chains, thereby increasing industry innovation, reducing trade friction and—ultimately—promoting more global trade.

By embracing open standards and interoperability, fostering trust across the ecosystem, and encouraging broad-based participation, 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.

TradeLens data is published directly from the source so the right people can securely manage their supply chain in real time. TradeLens breaks down longstanding data and processing silos that exists among trading partners and simplifies the flow of documentation that accompanies every shipment.

The TradeLens platform has been developed in a collaboration between Maersk and IBM and is supported by major players across the industry. Currently, the platform handles 10 million events and more than 100,000 documents every week.

TRADELENS OBJECTIVES

Connecting the ecosystem

TradeLens brings together all parties in the supply chain—including beneficial cargo owners, freight forwarders, inland transportation providers including rail and trucking, ports and terminals, ocean carriers, customs and other government authorities—onto a single, secure data-sharing and collaboration platform.

Driving true information sharing

TradeLens provides seamless, secure sharing of real-time, actionable supply chain information across all parties—encompassing shipping milestones, cargo details, trade documents, sensor readings and more—thereby empowering the consumers to mitigate problems through predictability and exception handling.

Fostering collaboration and trust

TradeLens enables the digitization and automation of cross-organization business processes integral to global trade, including import and export clearance, and—thanks to blockchain—ensuring key transactions and data, and all documents are secure, immutable and auditable.

Spurring innovation

TradeLens lays the foundation for ongoing improvement and innovation through an open API environment, the use of standards and promotion of interoperability. An Applications Marketplace will allow third parties to build and deploy applications on the TradeLens platform.

A COLLABORATIVE APPROACH

TradeLens is founded on the understanding that collaboration between both traditional and emerging partners in global trade—creates opportunities for innovation, efficiency, and growth.

It was in this spirit that IBM and Maersk came together as equal partners to co-lead development of TradeLens.

TradeLens is guided by the industry it serves. To ensure this, IBM and Maersk are forming an advisory board, that will shape the development of the TradeLens platform.

It is important to note that TradeLens is not a company. It is a solution for the industry built upon a model of transparency with benefits for all members of the ecosystem.

THE TRADELENS SOLUTION

TradeLens can be understood in three components: the Ecosystem, the Platform, and the Applications and Services Marketplace. Each component plays a distinct role in allowing TradeLens members to derive the most value for their businesses.

Ecosystem

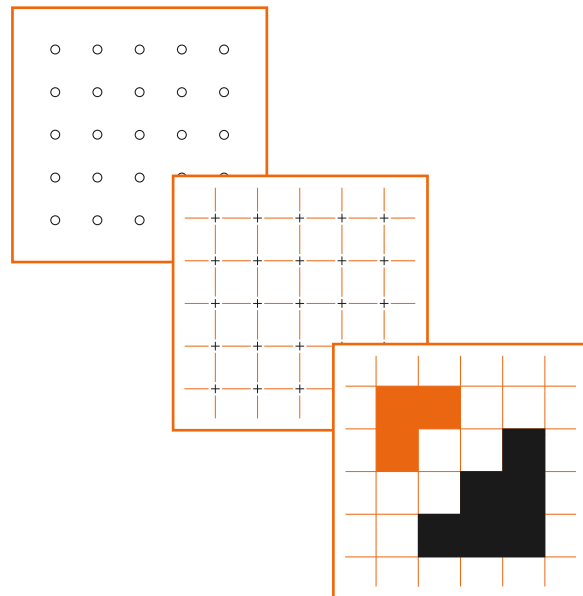
The foundation of TradeLens is its business network: shippers, freight forwarders, ports and terminals, ocean carriers, government authorities, customs brokers and more. Each entity shares information that can be tracked, stored and actioned across the platform throughout a shipment's journey.

Platform

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.

Marketplace

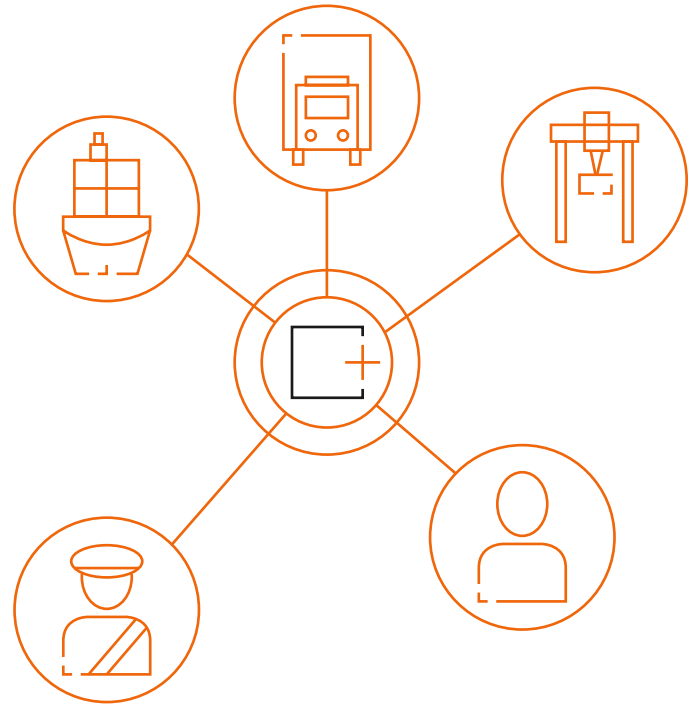
An open Applications and Services Marketplace allows both TradeLens and third parties to publish fit-for-purpose services atop the TradeLens platform, fostering supply chain innovation and value creation.



TRADELENS ECOSYSTEM

The TradeLens ecosystem includes all parties involved in the end-to-end journey of a shipment.

Any supply chain entity is able to join TradeLens, including ocean carriers, inland transporters, terminal operators, ports, shippers and beneficial cargo owners, 3PLs, customs administrations, and financial services companies.



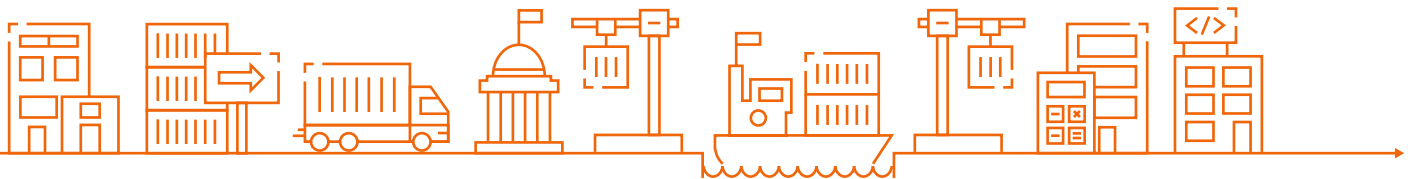
TRADELENS BENEFITS TO THE ECOSYSTEM

- + **Ports/Terminal Operators:** Pre-built connections to shipping lines and other actors, end-to-end visibility across shipping corridors, and real-time access to more information to enrich port collaboration and improve terminal planning.
- + **Ocean Carriers:** Reduced customer service and network integration cost, less revenue leakage, and less mis-declared cargo due to a digital audit trail of end-to-end shipment events and source document.
- + **Government Authorities:** More informed risk assessments, better information sharing, less manual paperwork, and easier connections to national single window platforms.
- + **Inland Transportation:** Improved planning and utilization of assets given real-time access to end-to-end supply chain events for shipments.
- + **Shippers/Beneficial Cargo Owners:** A streamlined and improved supply chain allowing for greater predictability, early notification of issues, full transparency to validate fees and surcharges, and less safety stock inventory.
- + **Freight Forwarders/3PLs:** Pre-built connections to the ecosystem, improved tools for customs clearance brokerage function, and real-time access to the end-to-end supply chain data to improve effectiveness of track-and-trace tools.
- + **Financial Services:** Access to a definitive and real-time source of information for trade finance and trade insurance.

SHIPPING MILESTONE VISIBILITY

Data that are precise and accessible to all parties help shipments move faster. TradeLens provides a real-time publish and subscribe mechanism for exchanging milestone data and shipping documents between the entities that are involved in the shipment.

Importers and exporters who use TradeLens can easily determine the status of their shipments through the Shipment Manager user-interface (see more below) or by subscribing to an event feed and integrating TradeLens data into their existing systems.



Shipment-level search

TradeLens allows you to find a shipment or container using a range of parameters, including booking, equipment or bill of lading numbers. The search results provide a detailed record of the shipment.

Transport planning

Access more than 120 shipment event types, communicated directly from the source, including document updates and planned, estimated and actual transport milestones.

Permissioned access

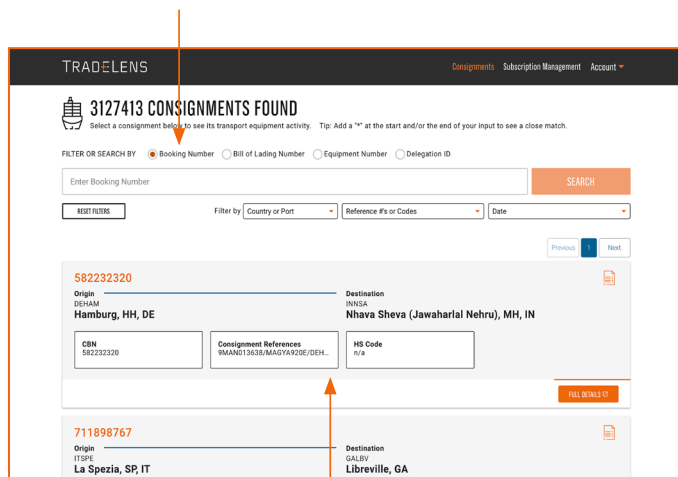
TradeLens ensures flexibility and control over who can view, publish and subscribe to shipment-specific data. Shipment milestones and documents are only accessible to authorized parties.

The Shipment Manager User Interface

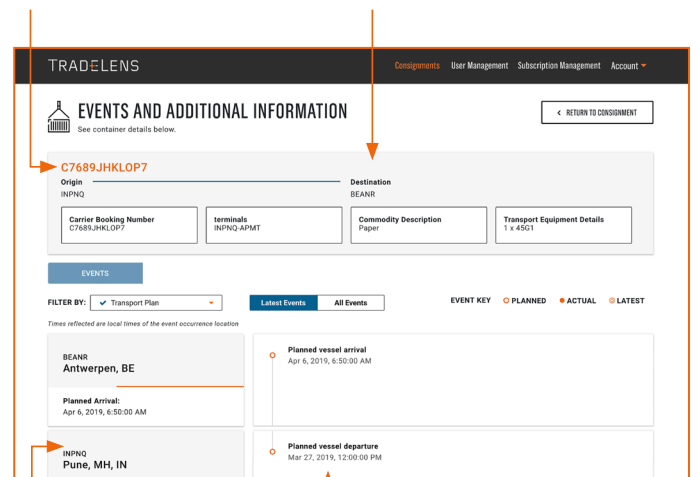
Consignments can be identified by booking, equipment, bill of lading and client reference numbers.

View shipping events, documents and transportation plan.

Events are sourced directly from carriers, ports, terminals and other parties to the shipment.



A single, secure, simplified view across all shipments in the supply chain

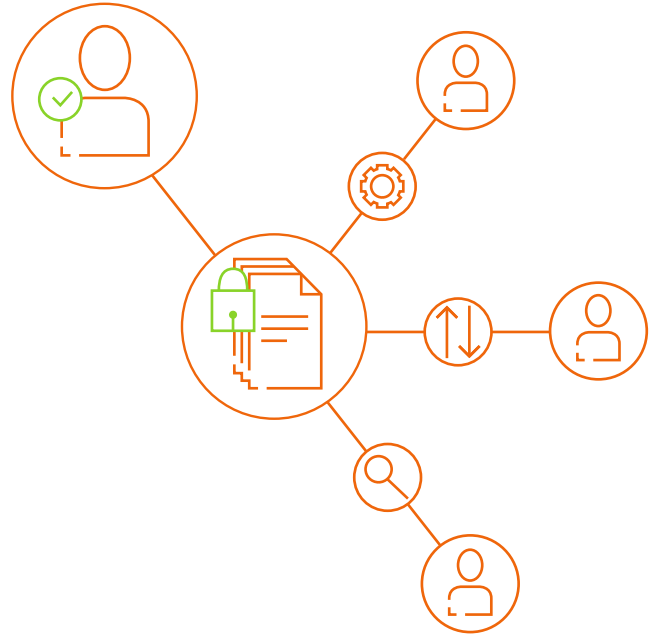


120 plus standardized events published from the source.

Real-time events directly from the source are instantly visible to all parties to a consignment.

DIGITIZED DOCUMENTS

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, viewed, and actioned by various parties to a shipment.



Documents can be uploaded and shared as either structured or unstructured documents

Structured documents

Structured documents, built to industry standards, provide rich data that can be readily located, analyzed and interpreted. The format enables efficient access, use and modification of information within a document, allowing for greater functionality and automation with reduced repetition and error.

Unstructured documents

Unstructured documents (like scans or PDFs), allows information-sharing between supply chain partners with disparate IT capabilities.

PERMISSIONED SHARING

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

TradeLens has and is continuing to develop standardized structured documents to replace the typical unstructured documents in use today.

- + 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
- + Fumigation Certificate
- + Inspection Certificate
- + Certificate of Analysis
- + Certificate of Origin
- + Dangerous Goods Declaration

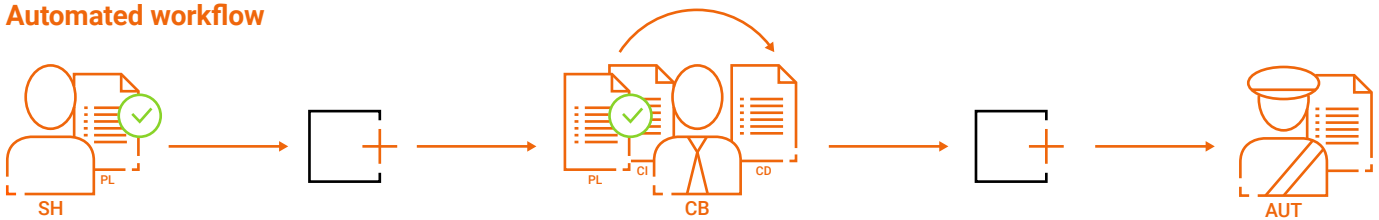
DIGITIZED DOCUMENT BENEFITS

- + Trade documents are associated with containers and consignments in a distributed and shared repository, eliminating endless file, folder and email searching for information.
- + TradeLens uses the Hyperledger Fabric permissioned blockchain to guarantee the immutability and traceability of trade documents.
- + Network participants assigned to a consignment can immediately access shared documents and data, never having to wait for a document to be sent.
- + Participants assigned to the consignment have default access rights based on a unified permissions model.
- + 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.

WORKFLOW AUTOMATION

With digitized documents and permissioned sharing, TradeLens facilitates the move away from legacy workflows (using paper or PDFs) within a single organization, to automated workflows across multiple organizations that dispense with costly, repetitive and error-prone manual inputs.

Automated workflow



1. At the time of container stuffing, a shipper uploads the final packing list in a structured document to TradeLens.
2. Accessing TradeLens via APIs, the broker's system pulls structured data from the packing list and Commercial Invoice. After the vessel has departed, the broker uses this data to create the customs declaration, including supplemental information to ensure a quicker clearance process.
3. All versions of the documents are stored in TradeLens, underpinned by blockchain to guarantee their immutability, traceability and auditability.

IMMUTABILITY

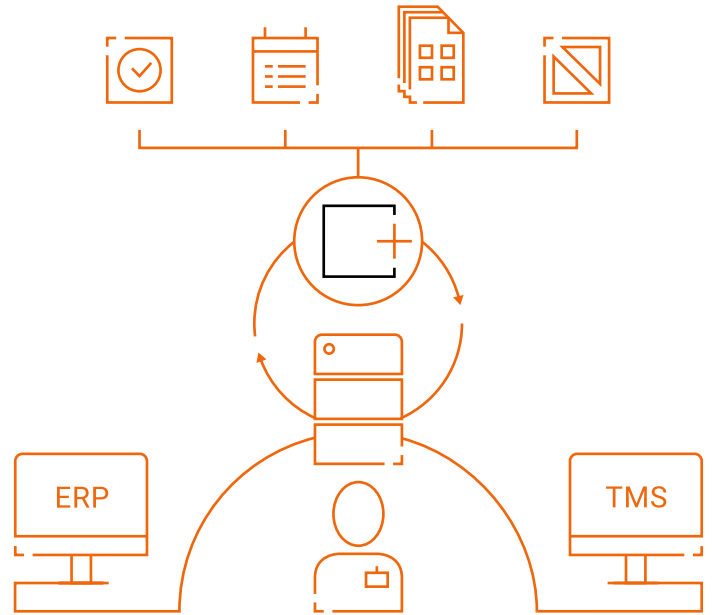
In addition to being able to download each version of a document, TradeLens also performs a Consistency Check to indicate a document has been verified on the blockchain. Once a document (or a version of a document) is selected, the document will be retrieved from the secure Blockchain Document Store and the

hash stored on the blockchain will be compared with a newly generated hash. After this check is complete, the Consistency Check will indicate that the document has been verified on the blockchain and has not been altered in any way.

APIs

TradeLens integrates with users' in-house systems via non-proprietary, publicly available APIs that are designed specifically for ease of set-up and use.

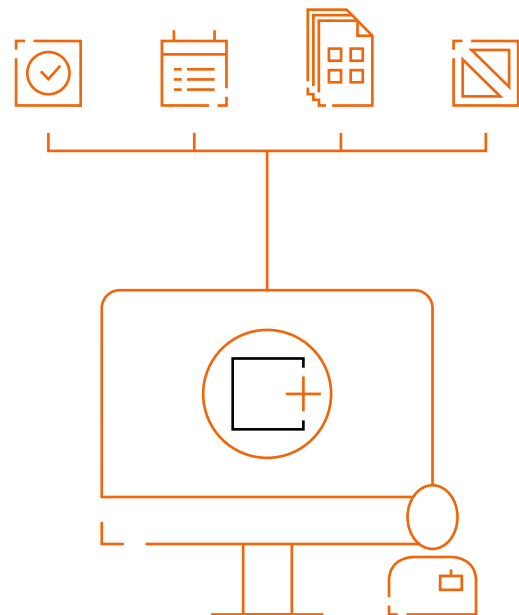
TradeLens uses Swagger for its APIs, which is a common framework for documenting REST APIs. The platform Event Publish API accepts shipping event data from publishers, which can be distributed through the platform Subscription API. This allows subscribers to receive notification of updated events that occur across the shipping lifecycle.



WEB UI

TradeLens has been developed to be adaptable and easy to use.

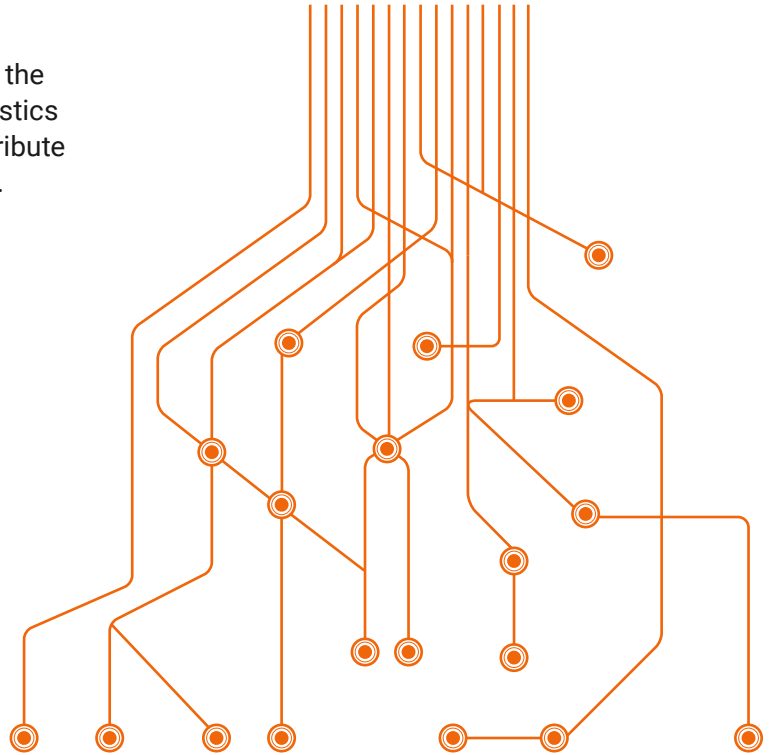
TradeLens can also be accessed via the web without integration. Users can engage with essential platform features including the search and track functions and document access through a secure SSO web app.



STANDARDS AND INTEROPERABILITY



TradeLens is a neutral platform that is available to participants of any party to a shipment, anywhere in the world. The platform provides a way for all major logistics and permissioned participants to immediately contribute to and extract value from the TradeLens ecosystem.



TradeLens is committed to the promotion and adoption of standards and interoperability of platforms:

+ Information standardization:

TradeLens will work closely with the advisory board, ecosystem members and standards bodies to help the industry develop and adopt standard codes and data models. The TradeLens data model and access control scheme aligns with UN/CEFACT.

+ Interface standards:

TradeLens is committed to openness, with all functionality surfaced via non-proprietary, publicly available APIs that are designed specifically for ease of integration.

+ Blockchain interoperability:

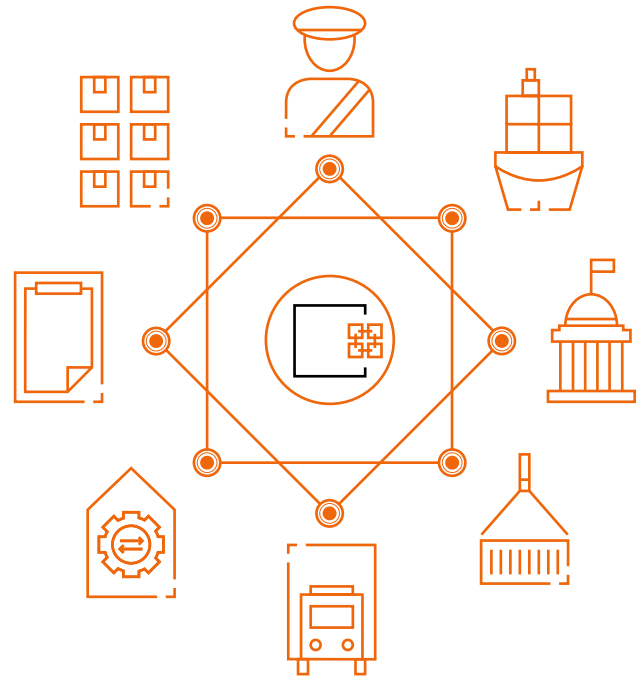
TradeLens is committed to facilitating standards for blockchain across the shipping industry, including cross-ledger namespace and data transfer between ledgers.

TRADELENS AND BLOCKCHAIN

The TradeLens blockchain is a shared, immutable ledger that records transactions and tracks assets—tangible or intangible. 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 ecosystem members, blockchain enables the secure distribution and storage of the vital information that is 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 platform. All data is signed by the submitter and recorded in the ledgers of the Trust Anchors.
- + **Recoverability** of the solution from the data recorded on the blockchain. All data is distributed and replicated across the ledgers of the Trust Anchors.
- + **Privacy** of data to ensure that it is only shared with relevant organizations. Only registered entities with Certificates can access the ledger. Channel Level Control Application Level Access Control.
- + **Verifiability** of data against the recorded proof of submission on the blockchain. Every piece of data can be verified against a **hash** of its original submitted content.
- + **Provenance and Auditability.** All transactions are signed and dated on the ledger.

COLLABORATE WITH TRADELENS

TradeLens is available today. Anyone can join the ecosystem to start collaborating with clients and business partners, and quickly gain access to instantaneous, high fidelity shipping information via the TradeLens web portal or via APIs. Shippers and BCOs can also provide and subscribe to data.

Interested participants should contact their local IBM or Maersk sales representatives or fill out the contact form on our website.

Contact your IBM or Maersk sales rep today to find out how you can increase productivity, cut down on query response times and drive greater customer satisfaction.

Or, reach out to us directly at www.tradelens.com/connect

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