

Key Trade Documents and Data Elements on the Frontlines

**Tracking the digitalisation of trade
through 22 case studies**



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Foreword

The Digital Standards Initiative (DSI) of the International Chamber of Commerce (ICC) is on a mission to digitalise global trade by addressing some of the biggest challenges facing governments, businesses and people today. Among the four challenges¹ we have identified, perhaps the steepest one is around standards for interoperability. With hundreds of electronic and digital standards in use across the global supply chain—and many more in development to enable paperless trade—the task of building a cohesive system is immense.

From the outset, a key objective of ICC DSI has been to make sense of these standards at a macro or ecosystem level. After 18 months of intensive collaboration with over 60 organisations, we published the Key Trade Documents and Data Elements (KTDDE) report in April 2024. This framework for digitalising the international supply chain references digital standards for every key trade process, represented by essential trade documents, ensuring that core and shared data can be interoperated and shared wherever needed.


This integrated system-wide framework marks an important step forward by providing clarity and a unified set of best practices for all stakeholders. However, to drive real change, we must pair this macro-level framework with micro-level guidelines that provide practical steps for implementation at every point in the supply chain. This is about changing the behaviour of organisations and individuals, whether they are public or private, large or small. We needed to answer the critical question: “But what do I do with it?”

To address this, we have compiled 22 cases that highlight the digitalisation of key functions along the supply chain, particularly focusing on areas where the use of digital trade documents and data standards is critical. Certainly, digital transformation is not new—and we do not claim to provide a comprehensive guide to transforming an entire supply chain. Yet, we hope that this report makes a timely contribution by providing practical insights for businesses and governments seeking to implement the KTDDE vision.

Our aim is, of course, to educate, but more importantly, to motivate businesses to take more steps to digitalise their key trade processes, by showing that there are many different routes to transformation. And while we did want to show cost and benefit analysis, in the end, we found that the process does not necessarily line up so neatly. There are definitely costs to digitalisation, but the benefits are quite significant, too. In some cases, customer needs or compliance cannot be achieved without digitalisation.

Governments play a crucial role in this transformation, providing policy leadership, controlling borders, and taking proactive steps to support digital trade. Our goal here is to articulate for governments just how businesses are grappling with the tasks of digital transformation—in all its diversity—so that public sector officials may become more informed and make policy that is in tune with where business needs to go.

¹ The four challenges are: legal reform, standards and interoperability, digital trust, and capacity building. Find out more at www.dsi.iccwbo.org.



I'd like to thank all the organisations and their teams who have opened themselves to contribute to this collection. And while we do not wish to suggest that there are “leaders and laggards”—as every organisation operates at its own pace, according to its own needs and resources—we are grateful for the generosity of the organisations in this collection. Our goal is to amass hundreds, or even thousands, of examples of digitalisation at work so that we may widen the circles of action.

We hope you will be inspired by the changes outlined herein, and in turn, make the most of your own digital transformation.

Pamela Mar
Managing Director,
ICC Digital Standards Initiative



Preface

As the global trade landscape becomes more digitalised, the importance of adopting standardised data elements and documents becomes increasingly clear. These standards are the backbone of interoperability, ensuring that diverse systems and platforms can communicate seamlessly across borders. This is not merely a technical requirement; it is the key to unlocking greater efficiencies, transparency, and resilience in supply chains worldwide.

ICC DSI has made significant progress in defining and identifying the standards framework needed for key trade documents and data elements. The KTDDE Framework represents a crucial step in laying the foundation for a digital trade ecosystem that is both scalable and sustainable. We now need to translate these high-level principles into actionable steps that can be taken immediately. This collection of case studies thus serves as a bridge between the vision of global trade digitalisation and its implementation by businesses and governments.

The ICC DSI Industry Advisory Board (IAB) has been instrumental in advancing this work. Several members have shared stories from their own organisations or the communities they represent, offering valuable insights into the practical application of digital standards. These contributions highlight the collective effort across industries and regions to embrace digital standards and drive meaningful change in global trade.

As we move from the strategic vision to real-world implementation, our goal is to provide a clear, actionable roadmap for businesses and policymakers alike. These case studies demonstrate that the path to digitalisation is not a one-size-fits-all journey. Instead, it requires tailored approaches that consider the unique needs and challenges of each sector, region, and organisation.

We invite you to explore these cases and draw inspiration from the innovative solutions they present. Whether you are just beginning your digital journey or looking to refine your existing strategies, we hope this collection provides the insights and guidance needed to take the next steps toward a fully digitalised trade ecosystem.

Stephan Wolf

Chair, ICC DSI Industry Advisory Board

Robert Beideman

Chair, ICC DSI KTDDE Working Group
Vice-Chair, ICC DSI Industry Advisory Board



Executive summary

Global trade is on the cusp of a transformation driven by digitalisation, where the physical flow of goods and finance are tracked and transacted through a similarly connected flow of data and electronic records. The key to accomplishing this is for all actors on the supply chain to use a finite set of digital trade standards which are interoperable, thus making possible the secure sharing of data wherever it is needed.


The aim of this report is to showcase how this transformation takes place on a practical level and for different actors along the supply chain. Digitalisation of four different processes is covered, with their respective impacts and benefits:

- **A—Shipping and logistics processes** focusing on the adoption of electronic Bills of Lading (eBL) and other digital tools. Digitalising these processes led to significant reductions in transaction times, enhanced data integrity, and improved operational efficiency. These benefits extend to shippers, clients, and forwarders, creating a more reliable and sustainable logistics ecosystem.
- **B—Commercial documents and product-related information**, such as test certificates and import documentation, utilising technologies like blockchain and digital identity. Companies have seen benefits in increased transparency, reduced costs, and enhanced traceability and trust among stakeholders.
- **C—Cross-border regulatory compliance**, including the implementation of National Single Windows and streamlined customs procedures. The digitalisation of these processes has benefitted traders, customs authorities, and logistics providers by enhancing compliance and operational efficiency.
- **D—Financial services and fraud prevention**, particularly looking at trade finance, digital identity, electronic transferable records, and consent-based data sharing. These innovations have enhanced security, speed, and accessibility in financial transactions, benefitting both financial institutions and small businesses.

The documented experiences highlight the progress made in digitalising the supply chain thus far using globally interoperable standards, and the potential for greatly enhanced speed, simplicity and data sharing.

By examining the experiences and strategies of various entities in adopting digital trade solutions, this report surfaces insights on digitalisation processes wherever they may occur in the trade ecosystem:

1. **Digitalisation can start anywhere along the supply chain:** Digital transformation does not follow a singular path, nor is there a universal “best starting point”. Organisations can begin where they have capability, or in areas where immediate value can be realised, such as automating manual tasks, or providing new and needed services to customers through digitalisation.
2. **Implementation capabilities will likely be drawn from both internal and external sources:** Organisations can choose between off-the-shelf solutions, proprietary systems, or partnerships with technology providers, depending on their specific needs and circumstances.

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3. **Leveraging standards is essential for long-term success:** The deliberate choice of globally interoperable standards will help to achieve interoperability with business partners, reducing friction, and ensuring seamless integration across the trade ecosystem.
 4. **Success metrics should be tailored to specific needs:** Companies must define success based on their unique goals, capabilities, and challenges. It may not always be possible in the first instance to discern a strict economic or commercial gain, but quantifying the benefits will help multiple stakeholders inside the organisation to understand and support the benefits.
 5. **Initial challenges are outweighed by long-term benefits:** While digitalisation may involve significant initial challenges, the long-term benefits, including operational efficiency and cost savings, outweigh these hurdles.
 6. **Benefits can come in unexpected ways:** Digitalisation can yield unexpected benefits, such as increased employee engagement, customer stickiness, or new opportunities for innovation, which should not be underestimated.
 7. **Iterative development and continuous learning will increase the gains over time:** Organisations should adopt an approach that prioritises continuous learning, iteration, and fast feedback cycles. Thus, a phased approach to digitalisation could help the organisation take advantage of its newly acquired capabilities.

Implications and recommendations

For businesses: Embracing digitalisation in trade processes can lead to substantial cost savings, greater operational efficiency, and enhanced competitiveness. By adopting standardised digital tools and ensuring interoperability, companies can streamline operations, reduce errors, and optimise supply chain management. This approach not only strengthens customer relationships but also opens up access to new markets and financing options, particularly for small- and medium-sized enterprises (SMEs). Businesses should focus on standardising trade data, simplifying interactions with partners, and securing data sharing to better leverage both traditional and alternative financing sources.

For policymakers: Policymakers and political leaders are critical in fostering an environment conducive to digital trade, by harmonising regulations, standardising processes, and investing in digital infrastructure. Governments should prioritise the development of interoperable public infrastructures that enable secure data sharing between trade participants and financial institutions, thus improving SMEs' access to working capital. Additionally, policies that enhance capacity building for customs officials and other regulatory agencies are critical for the successful adoption of digital trade solutions. By promoting public-private collaboration and ensuring the global trust and interoperability of digital identities, policymakers can facilitate more efficient cross-border trade and drive economic growth.

List of abbreviations

ACITI	Australian Centre for International Trade and Investment
ADB	Asian Development Bank
AMS	ASEAN Member States
API	Application Programming Interface
ASEAN	Association of Southeast Asian Nations
ASW	ASEAN Single Window
ATG	Africa Trade Gateway
ATIGA	ASEAN Trade in Goods Agreement
BCO	Beneficial Cargo Owner
BIMCO	The Baltic and International Maritime Council
CBDC	Central Bank Digital Currency
CBP	US Customs and Border Protection
CDI	Commercial Data Interchange
CARM	Customs Assessment and Revenue Management
COSCO	China Ocean Shipping Company
DCSA	Digital Container Shipping Association
DLT	Distributed Ledger Technology
DNI	Digital Negotiable Instrument
DO	Delivery Order
dPN	Digital Promissory Note
EDI	Electronic Data Interchange
eBL	Electronic Bill of Lading
eFBL	Digital FIATA Bills of Lading
eUCP	Uniform Customs and Practice for Documentary Credits for Electronic Presentation
ETDA	Electronic Trade Documents Act
FBL	Negotiable FIATA Multimodal Transport Bill of Lading
FCI	Factors Chain International

FMCG	Fast-Moving Consumer Goods
GLEIF	Global Legal Entity Identifier Foundation
GSBN	Global Shipping Business Network
HKMA	Hong Kong Monetary Authority
ICC	International Chamber of Commerce
ICISA	International Credit Insurance and Surety Association
IMDA	Singapore Infocomm Media Development Authority
IPPC	International Plant Protection Convention
IAB	Industry Advisory Board
ISO	International Organization for Standardisation
KYC	Know Your Customer
KTDDE	Key Trade Documents and Data Elements
LC	Letter of Credit
LEI	Legal Entity Identifier
MLETR	Model Law on Electronic Transferable Records
NACCS	Nippon Automated Cargo and Port Consolidated System
NOC	No Objection Certificate
NSW	National Single Window
OBL	Original Bill of Lading
PO	Purchase Order
RPP	Revenue Processing Plan
SME	Small- and Medium-sized Enterprise
TFA	Trade Facilitation Agreement
TREDS	Trade Receivables Discounting System
UN/CEFACT	United Nations Centre for Trade Facilitation and Electronic Business
UNCITRAL	United Nations Commission on International Trade Law
UNECE	United Nations Economic Commission for Europe
URC522	Uniform Rules for Collections
vLEI	Verifiable LEI
WCO	World Customs Organization
WTO	World Trade Organization



I Introduction

a. Overview of the DSI Key Trade Documents and Data Elements (KTDDE) Framework

In April 2024, ICC DSI launched a complete framework for end-to-end supply chain digitalisation, based on its 18-month analysis covering all [36 key trade documents](#). The report, together with its [interactive Key Trade Data Glossary](#), marked a breakthrough in digital trade bringing together all key trade documents in a single integrated framework, with data alignment that presented a clear path to interoperability and secure data sharing.

The vision aimed to simplify what had become a massive collection of thousands of data elements, hundreds of different version of trade documents, and dozens of ways to secure and share data along the supply chain, into a framework that could become the universal set of best practices for anyone wishing to digitalise any part of their supply chain. It was developed in response to clear needs to overcome complexity and chart a pathway to standards alignment and interoperability across the trade ecosystem.

The framework was developed by the KTDDE Working Group under the ICC DSI IAB, which brought together contributions of standards developers, regulators, United Nations agencies and industry users across horizontal and vertical supply chains. The [KTDDE Framework](#) offers a pathway towards globally aligned, interoperable trade ecosystems, which is the common objective of all parties involved in this work.

The KTDDE Framework, importantly, does not introduce new electronic trade document standards, but rather provides a means to connect and interoperate the standards that are already in use in business-to-government compliance processes as well as business-to-business transactions in the international supply chain. Thus, for any business considering further steps in digitalisation, this clarity of future interoperability should provide impetus to proceed further.

So the question, if not where to start, is where to digitalise next? This report aims to support businesses to understand the decision before them by presenting examples of how businesses all over the world, at every point in the supply chain, are digitalising the supply chain in ways that conform to the push for interoperable standards.

b. Purpose and scope of the report

This report aims to showcase examples of the implementation and adoption of the KTDDE digital standards and recommendations:

- A practical analysis of the specific challenges that organisations encounter in the digitalisation of trade, covering commercial, transport, cross-border regulatory processes and financing.
- Insights from industry players, transport service providers, banks, trade associations and government agencies on their approach, what worked, benefits reaped and lessons learnt.
- Actionable recommendations for joint efforts between governmental bodies and the private sector to improve efficiency, cut costs and foster greater visibility.

By highlighting these elements, the report seeks to provide relatable examples to accelerate and scale progress in digitalising trade and supply chains end-to-end.

II

The KTDDE Framework in practice across the international supply chain

A—Digitalising shipping and logistics processes

1. **Sucafina:** Transforming the coffee trade with digital solutions
2. **BHP:** Simplifying operations and enabling timely delivery with electronic Bills of Lading
3. **GSBN:** Enhancing data trustworthiness to unlock trade finance opportunities with tokenised electronic Bills of Lading
4. **GLEIF, WaveBL and TradeGo:** Integrating Legal Entity Identifiers and verifiable Legal Entity Identifiers into electronic Bills of Ladings
5. **Lloyds Bank:** Reducing transaction time with electronic Bills of Lading and digital Promissory Notes
6. **CargoX:** Helping freight forwarders eliminate the need for paper

B—Digitalising commercial documents and product-related information

7. **Tata Steel:** Digitalising test certificates with blockchain innovation
8. **TradeWaltz and Kanematsu Corporation:** Moving import document storage to the digital realm
9. **Enigio:** Future-proofing document exchange with minimal friction
10. **Air8:** Digitalising and standardising for faster lending to SMEs
11. **NeXTRADE:** Aligning master data in sales and procurement

C—Digitalising cross-border regulatory compliance

12. **ASEAN Single Window:** Integrating the National Single Windows through the harmonisation of technical solutions, business processes, and legal frameworks
13. **Dubai Trade:** Revolutionising supply chain efficiency with Trade+ digital Delivery Orders
14. **DHL:** Simplifying cross-border trade for SMEs
15. **Roanoke:** Enabling smooth compliance with electronic customs bond in the US market
16. **Australian Centre for International Trade and Investment:** Developing a Single Window System for the 21st century with KTDDE core data

D—Digitalising financial services and fraud prevention

17. **Hong Kong Monetary Authority and Commercial Data Interchange:** Enhancing consent-based data infrastructure to streamline loan approval for SMEs
18. **XDC Trade Network:** Facilitating faster access to trade finance liquidity with digital identity and digital Promissory Notes
19. **Swift and ICICI Bank:** Digitalising the Letter of Credit
20. **Vale International and HSBC:** Electronically presenting Letters of Credit using electronic Bills of Lading
21. **Afreximbank:** Africa Trade Gateway—Empowering African Trade under the African Continental Free Trade Agreement
22. **MonetaGo:** Leveraging standardised data points to alert financiers of potential fraud

A

Digitalising shipping and logistics processes

The digital transformation of shipping and logistics is not just about adopting new technologies. It is about fostering effective collaborations between corporates and solution providers to redefine the efficiency, transparency, and sustainability of global trade. This section explores how leading organisations have successfully partnered with digital solution providers to enhance their shipping and logistics operations, particularly through the adoption of eBL and other innovative digital tools:

- **Sucafina:** Partnered with Cargoo to automate 70% of its shipping volume by centralising and automating key tasks, significantly improving operational efficiency and productivity.
- **BHP:** Implemented a scalable eBL solution to reduce document amendment times from over a week to less than 24 hours, enhancing operational efficiency and customer satisfaction, especially on short voyages.
- **GSBN:** Utilised blockchain technology to create immutable and verifiable records, reducing CO2 emissions and enabling extended financing options, aligning economic goals with environmental sustainability.

- **WaveBL and TradeGo:** Integrated Legal Entity Identifiers (LEIs) to enhance trust and security in electronic transferable records, streamlining onboarding and facilitating faster, more secure transactions.
- **Lloyds Bank:** Digitalised the documentary collection process, reducing transaction times from 15 days to under 24 hours, leading to substantial operational improvements, cost savings, and enhanced customer satisfaction.
- **CargoX:** Helped freight forwarders cut drafting time for FIATA Bills of Lading by 80-90% and reduce sending costs by 70%, leading to significant operational efficiencies and improved document security.

These case studies illustrate how the successful digitalisation of shipping and logistics processes is not just about the technology itself but about the partnerships that enable these innovations. By working closely together, corporates, financial institutions and solution providers are setting new standards for efficiency, reliability, and sustainability in global trade.



Sucafina

Transforming the coffee trade with digital solutions

The opportunity

Addressing inherent inefficiencies in traditional shipping processes

Sucafina faced several challenges in its traditional shipping processes. The manual submission of booking and shipping instructions to multiple shipping line websites was time-consuming and prone to errors. Team members had to manually update system details, requiring more administrative staff and diverting focus from more productive tasks. Frequent email exchanges for updates between shippers, Sucafina, and clients led to inefficiencies and potential errors. Additionally, the lack of visibility into the status of shipping instructions and bookings resulted in multiple communication loops, a situation that is unsustainable especially during peak seasons.

The solution

Digitalising all shipping-related communications and documentation in one place

Sucafina partnered with Cargoo to digitalise and centralise its shipping processes. Cargoo became the centralised platform for submitting bookings, VGM (verified gross mass), SIs (shipping instructions), and Bill of Lading (BL) instructions. A link between Cargoo and Sucafina's planning system ensured automatic updates, eliminating the need for manual data entry. Furthermore, shippers, clients, and forwarders were encouraged to join Cargoo, reducing email exchanges and enhancing collaboration through a single platform. This seamless integration enabled the electronic creation and transfer of shipping instructions and allowed shippers to send booking requests with minimal manual input through Application Programming Interfaces (API).

The impact

A driver for optimisation and single source of truth for all stakeholders

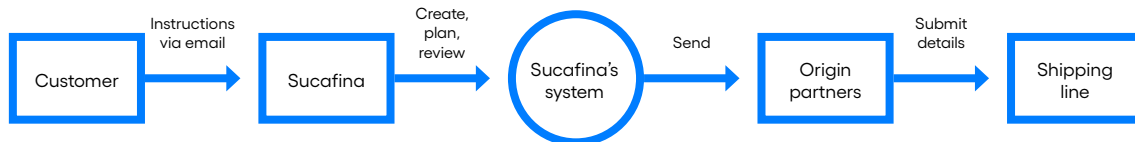
The solution resulted in significant benefits for not only Sucafina but also its shippers, clients, and forwarders:

- **Efficiency gains:** The time to update booking information was reduced from five minutes manually to instant updates via Cargoo. SI submissions now take only four minutes instead of 10 minutes per submission, resulting in a 60% time reduction for multiple submissions. Email updates to clients were reduced by 50%, from eight emails per month to four.
- **Accuracy and trust:** Automated draft BL issuance reduced errors, as cargo booking and labeling instructions are submitted directly through Cargoo. All updates are tracked on Cargoo, providing a single source of truth for all stakeholders.

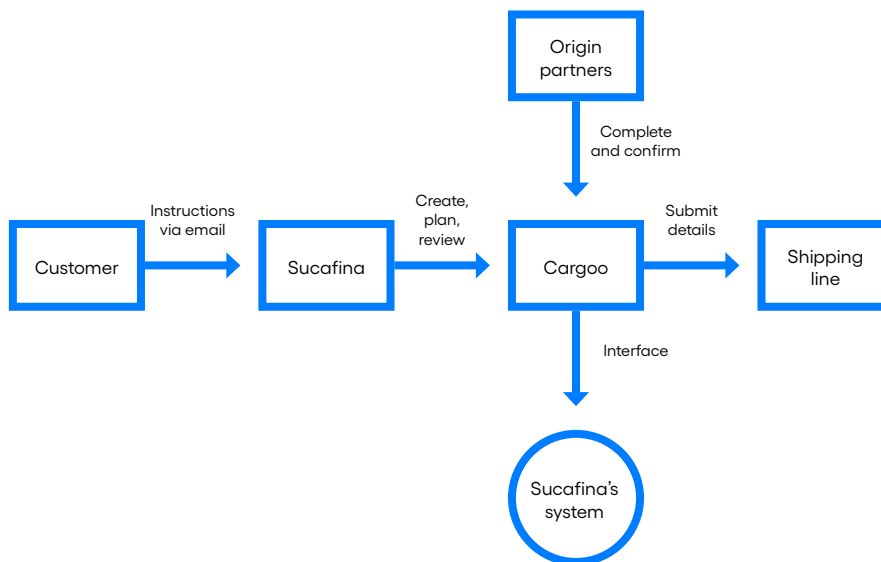
- **Resource optimisation:** Employees can now focus on value-adding tasks, such as skill development and meticulous planning, rather than administrative updates. Over 70% of Sucafina’s shipping volume is now automated, covering planning information from shipper’s letter of instruction to booking requests and track and trace events.

Figure 1: Shipping process before and after adopting digital solutions

Without Cargo



With Cargo



Source: Sucafina, 2024

“The use of standardised data elements across the board has led to a leaner approach to shipping by reducing email exchange, cutting down processing time for shipments, and allowing employees to focus on continuous improvement rather than administrative tasks. This has enabled us to create a more efficient and trustworthy shipping process, benefitting all stakeholders involved.”

Raphaelle Hemmerlin, Chief Transformation Officer, Sucafina SA

“As a long-term solution partner, we appreciate the opportunity to support Sucafina in digitising their supplier facing workflows and ocean container transportation processes. We are pleased that within a short time Sucafina reported 50% to 60% efficiency gains, improved data accuracy and improved oversight of their processes. With the majority of Sucafina’s shipping volume now automated, we look forward to further collaboration to optimise their supply chain.”

Thomas Kofler, Chief Commercial Officer, Cargo



BHP

Simplifying operations and enabling timely delivery with electronic Bills of Lading

The opportunity

Streamline the logistics process and address the risk of delays, inefficiencies, and errors

The reliance of courier services in the use of traditional Original Bill of Lading (OBL) can cause delays in import customs clearances and result in late payments, particularly on short voyages where timely documentation is critical. These issues may be exacerbated in instances where OBLs require amendments following their issuance.

The solution

Implementing eBL solutions for iron ore shipments

BHP has implemented a third-party eBL solution for its iron ore shipments to streamline the logistics process and address the risk of delays, inefficiencies, and errors commonly associated with the use of traditional OBL. This solution is scalable, capable of handling larger volumes of eBLs without increasing marginal costs, making it an efficient and sustainable choice for the future.

The impact

Same day turnaround instead of a week strengthened operational efficiency, customer relationships and market reputation

Through the adoption of eBL, BHP has managed to overcome these challenges. In a recent case, BHP, in cooperation with its customers, the banks, and shipowners managed to procure an amendment to an issued eBL in less than 24 hours—a significant improvement over the traditional method, which could take a week or more due to the need for physical document handling.

Immediate benefits of the eBL solution:

- Real-time amendments ensured accurate documentation at the destination port
- Avoided delays in customs clearance
- Reduced turnaround time for document amendments from potentially over a week to just a few hours
- Improved BHP's operational efficiency
- Enhanced customer satisfaction by meeting documentation needs promptly and accurately

"In a positive step towards trade digitalisation, we've seen significant momentum in the adoption of electronic bills of lading (eBLs) across the bulk sector, and BHP is pleased to have contributed towards BIMCO's "25 by 25" campaign. The implementation of the eBL platform has transformed our operational process. We can now make critical amendments quickly, ensuring our customers receive the accurate documentation they need without delays. This has not only improved our operational efficiency but also strengthened our customer relationships and market reputation for our ability to fulfil customer orders in full, on time, every time."

Chan Hui Ling, Vice President, Global Business Services for Order-To-Cash, BHP



GSBN

Enhancing data trustworthiness to unlock trade finance opportunities with tokenised electronic Bills of Lading

The opportunity

Facilitate the sharing of trusted data to reduce shipping's carbon footprint and the trade finance gap

Global shipping volumes are forecasted to double by 2050, potentially increasing the shipping industry's share of greenhouse gas (GHG) emissions from 3% to 17%. Physical handovers of shipping documents contribute a major yet unnecessary cause of GHG emissions. Many shipping companies and their customers face unprecedented challenges in dealing with carbon-intensive Original Bill of Lading (OBL) in an increasingly digital and disruption-prone world. Meanwhile, the global trade finance gap grew to a record \$2.5 trillion in 2022, according to the [Asian Development Bank \(ADB\)](#). The heavy reliance on paper documents for financing processes has hindered the sharing of trusted data, limiting participation from entities that could serve the financial needs of SMEs.

The solution

Leveraging blockchain for reliable sharing of trustworthy shipping data

GSBN addresses these challenges by leveraging blockchain technology to ensure reliable sharing of trustworthy shipping data. By enabling the issuance of eBL over its blockchain network, GSBN provides an immutable, verifiable source of truth that all stakeholders in the global supply chain can trust.

The adoption of eBL has rapidly expanded across the maritime shipping sector, initially with major container lines like COSCO Shipping Lines, OOCL, and Hapag Lloyd, and later extending to bulk cargo shipping. In 2024, COSCO Shipping Bulk utilised eBL issued on GSBN to transport over 1 million metric tons of commodities, serving key customers such as Yancoal and Chinalco.

GSBN's secure data sharing has also attracted interest from financial institutions like the Bank of China that are exploring ways to leverage eBL data to bridge the global trade finance gap, particularly benefitting SMEs.

In partnership with Ant Digital Technologies, GSBN has also begun tokenising eBL, facilitating the securitisation of physical trade flows and enabling access to alternative financing sources. This tokenisation initiative, recognised as a key use case under the Hong Kong Monetary Authority's Project Ensemble, allows eBLs to be traded and settled using advanced financial networks supported by stablecoins, Central Bank Digital Currencies (CBDCs), or tokenised deposits, thus unlocking new opportunities in the financial sector.

The impact

Extending working capital loan tenor while slashing CO2 emissions

To date, over 300,000 eBLs have been issued on GSBN with a total estimated cargo value of \$45 billion for over 14,000 companies engaged in global trade.

- **Positive environmental impact:** Based on a study conducted by SIA Partners, this volume of eBLs issued over GSBN equates to an estimated 8,370 metric tons in CO2 savings. This is equivalent to removing about 1,334 passenger vehicles from the road for a year, based on an average annual emission of 4.6 metric tons of CO2 per vehicle (source: [U.S. Environmental Protection Agency—EPA](#)).
- **Increased financier confidence:** Tokenising eBLs also makes warehouse financing easier. Commodities shipped to import terminals are typically stored in a warehouse facility until they are drawn upon for manufacturing needs. Having an eBL serve as the genesis token and trusted representation of the physical cargo can give financiers greater confidence to provide the necessary financing for the working capital needs of the consignee, instead of relying on a traditional warehouse receipt.
- **Improved working capital:** By tokenising eBLs for warehouse financing, the loan duration can be extended from the typical one month of transportation time to over six months, providing more flexibility in the working capital of consignees.

“As the shipping industry sails towards a greener future, the journey to net zero is not just about green alternative fuels but also about transforming the very fabric of trade through digitalisation. The mass adoption of eBL can not only enhance data trustworthiness between parties, but also offer novel commodity financing products to address the working capital needs of SMEs engaged in global trade.”

Bertrand Chen, CEO, GSBN



GLEIF, WaveBL and TradeGo Integrating Legal Entity Identifiers (LEI) and verifiable LEIs (vLEI) into electronic Bill of Lading platforms

The opportunity

Addressing identification challenges in a multi-party environment

eBL platforms face significant challenges in party identification due to the complexity of international trade and the need for secure, reliable, and legally recognised processes. Different actors in the trade ecosystem often use various regional or sector-specific standards and protocols, complicating seamless identification, interoperability, and communication. For eBLs to be legally recognised, the identification processes must meet stringent legal requirements, ensuring that all parties involved in the endorsement process are accurately verified and documented in a globally accepted process.

The solution

Enhancing security and reliability through standardised identifiers

WaveBL and TradeGo, two leading eBL platforms, are embedding the use of LEIs and vLEIs to address these challenges. LEIs are unique identifiers for legal entities participating in financial transactions, while vLEIs are verifiable, adding an extra layer of security. By pairing platform digital identifiers with LEI data from the Global Legal Entity Identifier Foundation (GLEIF) API, both platforms aim to support real-time, standardised, and interoperable identification, enhancing trust across their networks.

The LEI field is used in the Digital Container Shipping Association (DCSA) and Baltic and International Maritime Council (BIMCO) eBL standard for shippers, consignees, and notify parties. Connecting this data on the eBL with the verifiable identity of counterparties adds an additional layer of assurance for reliable identification of legal entities in transactions on the platforms.

The impact

Streamlining processes and securing transactions for greater efficiency and trust

The embedding of LEIs and the introduction of vLEIs is expected to significantly enhance the security and reliability of platform digital identifiers and their pairing with LEIs. Organisations can use vLEIs to prove their identity within the endorsement chain, ensuring that only legitimate representatives can endorse these electronic transferable records. This added layer of verification helps prevent fraud, increases accountability, and improves trust among stakeholders.

A full implementation of LEIs and vLEIs on both WaveBL and TradeGo platforms is expected to yield significant benefits:

- **Streamlined onboarding processes:** Leveraging GLEIF's API has streamlined party registration and network identification, reducing the onboarding process from three days to three hours.
- **Eliminating discrepancies:** Accurate LEI-based identification of legal entities enhances trust among stakeholders, including regulatory supervisors. Platform alignment with LEI records reduces discrepancies by 100%.
- **Enhanced security and transparency:** Greater transparency across the shipping industry is achieved through the use of globally accepted verification of platform digital identities, offering a more secure and reliable digital document transfer.

"The integration of LEIs into our platform ensures the accuracy of digital identities, enhancing trust and transparency within our network and sets the stage for platform interoperability. As WaveBL is in search of a globally accepted standard, we have found that the introduction of vLEIs could radically streamline this process by providing a trusted, automated, and universally accepted solution for verifying companies' digital identities worldwide."

Noam Rosenfeld, CEO, WaveBL

"We firmly believe that the optimal approach to interconnecting various eBL platforms may not solely rely on a framework addressing technical and legal issues. Instead, it could be achieved through an enterprise-level account system based on a unified ID. This account system has the capability to generate and store diverse electronic documents and even facilitate digital payments, effectively addressing the current challenges of interconnecting eBL from a different perspective. Currently, vLEIs represent the best practice solution for enterprise-level IDs on a global scale. TradeGo will closely collaborate with GLEIF to continuously explore and experiment with vLEIs in various value scenarios in the future."

Jason Yu, CEO, TradeGo



Lloyds Bank

Reducing transaction time with electronic Bills of Lading and digital Promissory Notes

The opportunity

Digitalising traditional trade product offerings under a newly revamped legal environment

Since the global trade landscape has shifted towards digitalisation, more and more jurisdictions have responded by creating an enabling legal environment to facilitate the trusted exchange of electronic transferable records. In 2023, the UK passed the Electronic Trade Documents Act (ETDA), giving electronic documents of title the same legal treatment, effects and functionality as their paper counterparts. This provided corporates, banks and financial institutions with the opportunity to leverage BLs, Bills of Exchange and Promissory Notes in electronic form to reduce costs, accelerate transaction timelines, whilst increasing trade and access to trade finance.

The solution

Enhancing the documentary collection process with end-to-end digitalisation

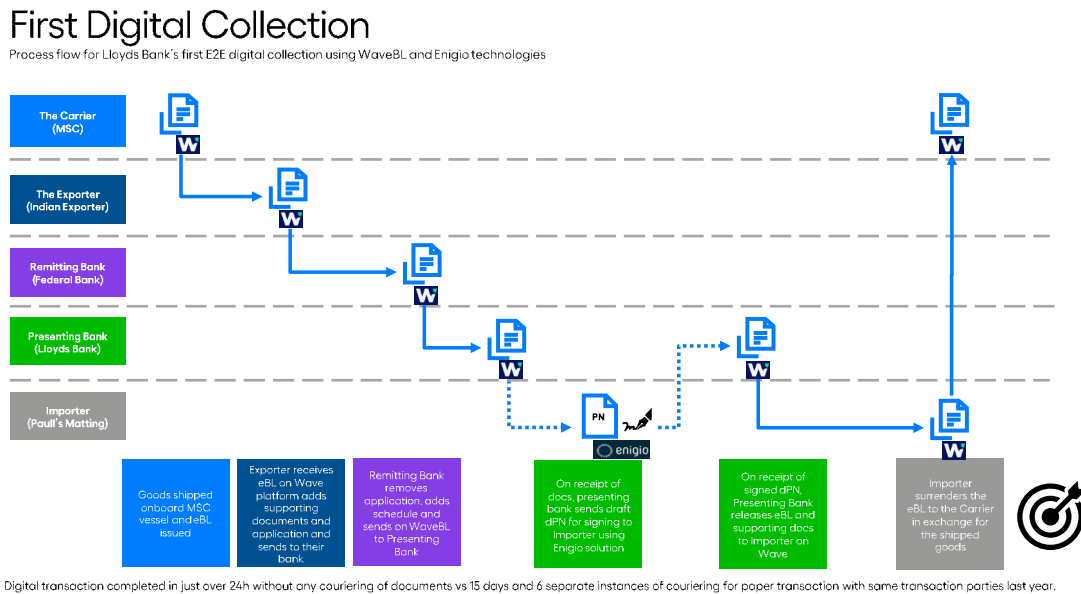
In April 2024, Lloyds Bank fully digitalised the eBL element of a transaction using WaveBL, completing the first digital documentary collection for Paull's Matting, an SME client. This process included the issuance of both the eBL and a digital Promissory Note (dPN). The graphic below shows the end-to-end process:

- The Mediterranean Shipping Company (MSC) issued an eBL on the WaveBL platform and sent it to the Indian exporter.
- The exporter added supporting documents and transmitted them to the remitting bank, Federal Bank in India.
- Federal Bank then replaced the application form with their collection schedule and sent the documents to the presenting bank, Lloyds Bank.
- Lloyds Bank created a draft dPN using Enigio's solution and sent it to the importer, Paull's Matting, for signing.
- Paull's Matting accepted the payment obligation by signing the dPN, and Lloyds Bank transmitted the eBL and supporting documents to Paull's Matting, who then surrendered the eBL to MSC on WaveBL platform, completing the digital process smoothly and efficiently.

"These digital trade solutions have already brought major benefits to our business. Not only did it help complete the transaction faster, but we were able to spend less time on paperwork and more time focusing on the day-to-day running of our operations—something that's really important to us as a family-run company that regularly trades with overseas partners. Our thanks to the team at Lloyds Bank for their support throughout this process and we look forward to utilising these digital solutions in the future."

Douglas Paull, Director, Paull's Matting

Figure 2: Process flow for Lloyds Bank's first E2E digital collection using WaveBL and Enigio technologies



Source: Lloyds Bank, 2024

The impact

Eliminated paper and reduced transaction time from 15 days to under 24 hours

This comprehensive digital solution streamlined the trade process, benefitting all parties involved:

- The use of the eBL reduced transaction completion time from 15 days to under 24 hours, significantly lowering costs, the environmental impact, and the risk of losing key papers.
- Couriering of physical documentation was reduced from six times to none.
- The dPN allowed Paull's Matting to accept its payment obligation digitally, facilitating the quicker release of the eBL by Lloyds Bank.

"Together, the eBL and the dPN have eradicated the need for any physical paper to change hands. This has meant a faster transaction, which helps shorten parties' working capital cycles, with less risk, at lower cost and with significantly less admin for the businesses involved. We're looking forward to helping more companies take advantage of the significant benefits digital trade offers."

Rogier van Lammeren, Head of Trade and Working Capital Products, Lloyds Bank

"Documentary collections have offered importers and exporters a simple way to mitigate payment and performance risk globally for many years, they are however overdue for digitalisation. For these initial digital transactions we've seen marked benefits including significant reduction in transaction time, removal of couriering physical documentation and, for D/P transactions, the ability to create new financing opportunities that were not viable in the paper world. As we grow out our digital collection offering we're excited at the prospect of our clients taking advantage of these benefits and embracing digitalisation of this foundational trade solution."

Surath Sengupta, Head of Trade Innovation and Transformation, Lloyds Bank



CargoX

Helping freight forwarders eliminate the need for paper

The opportunity

Overcoming logistical inefficiencies by replacing paper-based trade document transfers

Traza Logistica, a leading international freight forwarding company with presence in Argentina and Chile, faced significant challenges in managing the issuance and transfer of FIATA Bills of Lading (FBLs). The traditional process—reliant on paper templates, printing, and courier services—was not only time-consuming but also costly, particularly for recurring shipments. As the company sought to streamline its operations and maintain a competitive edge in the fast-paced logistics industry, the need for a more efficient, secure, and cost-effective solution that adhered strictly to FIATA's business rules became increasingly urgent.

The solution

Enhancing efficiency by adopting digital solutions for FIATA Bills of Lading

To address these challenges, Traza Logistica adopted CargoX's Blockchain Document Transfer (BDT) platform, which offers a complimentary service for the drafting and issuance of electronic FIATA Bills of Lading (eFBL). This digital solution allowed Traza Logistica to eliminate paper-based templates entirely, enabling the company to draft and issue eFBLs efficiently while ensuring full compliance with FIATA's structured data requirements.

The CargoX Platform offers a straightforward, guided approach for entering the necessary data for eFBLs, significantly simplifying the process. The ability to create templates from existing eFBLs proved particularly valuable for recurring shipments, where only the quantities vary. Additionally, the platform's capability to transfer the document of title from one party to another within seconds eliminated the need for costly and time-consuming courier services. This not only allowed for quicker transfers but also provided a broader window for any necessary post-issuance amendments, which could now be made before the documents reached the parties involved, avoiding the delays and complications that previously occurred when amendments were only discovered after receiving the paper copies.

The impact

Revolutionising logistics and reducing money and time cost

The transition to CargoX's digital solution has delivered substantial benefits for Traza Logistica:

- **Cost reduction:** The shift from paper-based FIATA BL forms to digital eFBLs has eliminated paper and printing costs. Furthermore, sending costs have been reduced from over €50 in courier fees to just €15.

- **Time efficiency:** Drafting a BL for recurring shipments now takes under two minutes with the CargoX eFBL template—an 80-90% reduction from the previous 10-15 minutes spent using Excel and printing. This improvement not only saves time but also minimises the risk of delays, reducing potential demurrage costs at ports.
- **Global reach and security:** The ability to instantly transfer eFBLs globally ensures timely document delivery, which is crucial for maintaining the efficiency of the shipping process and avoid potential demurrage cost. The enhanced security of digital transfers also improves the overall reliability of document handling, providing confidence and peace of mind to all parties involved.

“In maritime shipping, time is money—and delays mean financial loss! Reducing the time required to prepare, sign, and send documents is crucial for efficiency, as is ensuring the timely delivery to avoid potential demurrage costs at the port. The shift to fully digital issuance and instant global transfer of bills of lading, with enhanced security, is revolutionising the industry.”

Peter Kern, VP Commercial, CargoX

B

Digitalising commercial documents and product-related information

The digitalisation of commercial documents and product-related information is crucial for ensuring accuracy, compliance, and speed in today's fast-paced trade environment. At the core of this transformation is the adoption of standardised data formats and the integration of structured data across various documentation processes. By seamlessly linking different documents into a cohesive digital workflow, companies can significantly reduce errors, enhance compliance, and improve overall operational efficiency:

- **Tata Steel:** Implemented a blockchain-based system to issue and verify test certificates, enhancing supply chain integrity by linking certificates directly to product data and reducing the risk of counterfeiting.
- **Kanematsu Corporation:** Digitised paper-based import documents and adopted a structured data format, streamlining document management, reducing storage costs, and improving compliance and audit efficiency.
- **Enigio:** Transitioned to digital documentation by standardising and linking all trade documents across the supply chain, reducing transaction times, costs, and enhancing the security and reliability of the documentation process.
- **Air8:** Leveraged standardised templates for financial documents within a key supply chain ecosystem, automating processes to streamline operations and facilitate faster lending decisions, particularly benefitting SMEs.
- **NeXTRADE:** Aligned master data across sales and procurement processes, reducing errors, improving order accuracy, and enhancing delivery performance, leading to significant time and cost savings for food manufacturers and retailers.

These case studies collectively demonstrate that the successful digitalisation of commercial documents and product-related information hinges on the intentional use of global standards and structured data. By linking different documents and data elements into a cohesive digital workflow, companies can achieve greater transparency, efficiency, and reliability in their trade operations.



Tata Steel

Digitalising test certificates with blockchain innovation

The opportunity

Addressing the challenge of counterfeit tubes

Precision tubes are critical components used in applications such as boilers, where reliability and safety are paramount. Tata Steel, a leading producer of these tubes, faced a significant challenge with counterfeit products. The market saw more tubes sold under the “Tata Brand” than the company actually produced. This discrepancy posed serious risks. Ensuring traceability was crucial for addressing liabilities and taking corrective actions, but the difficulty of marking tubes and the widespread distribution through various channels made it easy for counterfeiters to forge or fake certificates. This situation undermined customer trust and potentially jeopardised safety in critical applications. Tata Steel needed a robust solution to ensure the authenticity of their products and maintain their reputation for quality.

The solution

Implementing secure and verifiable certificates

Tata Steel implemented a blockchain-based test certificate issuance system to combat counterfeiting and enhance traceability. This innovative solution involved issuing and locking certificates for the tubes into a blockchain, creating a secure and immutable record that made it virtually impossible for counterfeit certificates to be created or altered. The system was designed to integrate seamlessly with Tata Steel’s distribution network, ensuring that authentic certificates could be verified by distributors and end customers.

The impact

Enhanced trust and traceability in the supply chain

The implementation of the blockchain-based test certificate system had a profound impact on Tata Steel’s operations and stakeholder trust, offering several key benefits:

- **Increased confidence and trust:** Distributors could confidently verify that Tata Steel had certified the material, reinforcing trust in the supply chain, while end customers were protected from fraud, ensuring they received genuine Tata Steel products.
- **Enhanced traceability and efficiency:** The blockchain system allowed Tata Steel to quickly trace materials and resolve any genuine claims efficiently, significantly reducing the time and resources spent on resolving claims and disputes.
- **Reduction in counterfeiting:** The secure nature of blockchain significantly reduced the occurrence of counterfeit products in the market, enhancing accountability and safety. By adopting cutting-edge technology, Tata Steel positioned itself as a leader in innovation within the steel industry, setting a new standard for quality control and reliability.

“Digitalising the test certificate process with blockchain technology has injected verifiable trust into our supply chain, drastically reducing counterfeiting risks. This innovation enhances traceability and sets new benchmarks for trust and reliability in the steel industry.”

Sarajit Jha, Chief Business Transformation Services and Digital, Tata Steel





TradeWaltz and Kanematsu Corporation

Moving import document storage to the digital realm

The opportunity

Modernising traditional paper-based document storage for enhanced data sharing and audit compliance

According to [UNCTAD \(2017\)](#), an average customs transaction involves 40 documents with 200 data elements (30 of which are repeated at least 30 times), indicating that 60–70% of all data needs to be entered multiple times. For typical import transactions, eight to 10 documents are required, totaling 10 to 15 pages. In addition to the repetitive and cumbersome processing work, importers must retain import documents for up to seven years for retrospective inspections.

For major trading companies like Kanematsu Corporation, the urgency of digitising these traditionally paper-formatted documents, including import permits, waybills, and invoices necessary for customs clearance, becomes increasingly evident.

The solution

Leveraging blockchain and distributed ledger technology (DLT) for import document storage

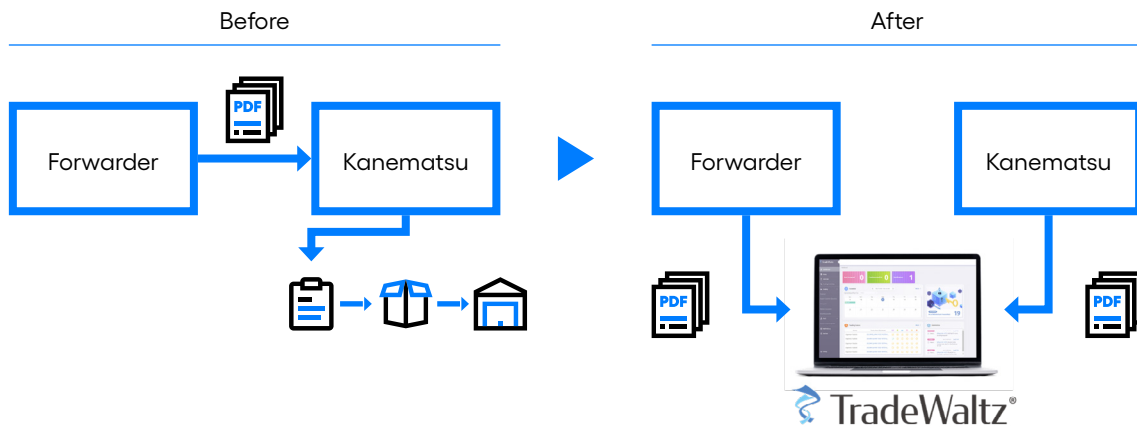
Kanematsu Corporation has taken the first step towards digitising trade since April 2024. The company transitioned its paper-based import-related documents—such as import permits, invoices, packing lists, and arrival notices—into digital formats by leveraging blockchain and DLT, seamlessly integrating with Nippon Automated Cargo and Port Consolidated System to receive import permits in structured data formats. This integration enables import permits to be linked with other trade documents, transforming traditional paperwork into searchable data elements that can be easily consolidated and transferred to stakeholders along the supply chain. This facilitates real-time data sharing and status updates.

The impact

Reducing costs while boosting efficiency and compliance

- Substantially reduced labour costs associated with printing, filing and storing hundreds of thousands of paper documents
- Minimised need for physical storage space and related fees
- Achieved higher level of compliance through collectively managed digital documents
- Streamlined document search processes for post-clearance audits by customs and improved audit efficiency

Figure 3: Document-sharing before and after using centralised data management



Source: Kanematsu, 2024

“We aim to digitise numerous paper documents subject to post-import investigations, enhance efficiency, and strengthen compliance by leveraging TradeWaltz for centralised data management and search capabilities linked with import permit data. Furthermore, we plan to advance the digital transformation of our trade operations, including exports, by digitally sharing this data with external partners in the next phase”

**Kazuhiro Fukushima, General Manager of Transport and Insurance Department,
Kanematsu Corporation**

The Enigio logo is displayed in white text against a dark green background with a pattern of curved, overlapping lines that create a sense of depth and movement.

Future-proofing document exchange with minimal friction

The challenge

Future-proofing trade finance operations in a diverse supply chain

A leading multinational corporation based in the Northern Hemisphere faced the challenge of ensuring that its global trade operations remained efficient and secure in an increasingly digital world. Despite having transitioned many internal processes to digital systems, the company's exchange of critical trade documents still relied on traditional paper methods. This reliance on paper created delays, increased costs, and introduced risks, especially in complex, multi-party transactions.

Recognising the need to modernise its approach to trade documentation, the company sought a solution that could preserve the integrity and reliability of paper documents while offering the speed and efficiency of digital processes. The goal was to implement a system compliant with existing legal frameworks that could be easily adopted by all supply chain participants.

The solution

Migrating document exchange to digital while preserving user-friendliness and flexibility

To address these challenges, the company partnered with Enigio to digitalise its key trade documents. Together, they created digital versions of essential trade documents used by the corporation and its supply chain partners, including Shipping Instructions, Commercial Invoices, Certificates of Origin, and more. These digital documents were designed to be both human-readable and machine-processable (see Figure 4), ensuring easy verification and seamless sharing across the supply chain.

Enigio focused on ensuring that the digital documents adhered to the KTDDE Framework, which promotes consistency and interoperability across all involved parties. The collaboration also prioritised making the transition as smooth as possible for all supply chain partners, ensuring that no additional systems or complex integrations were required.

Through this approach, the company was able to digitalise a complete set of trade finance documents, including Bills of Exchange, Letters of Credit (LC), and others. The digital documents maintained all necessary legal attributes while embedding the relevant data points, making them secure, verifiable, and easily transferable among partners.

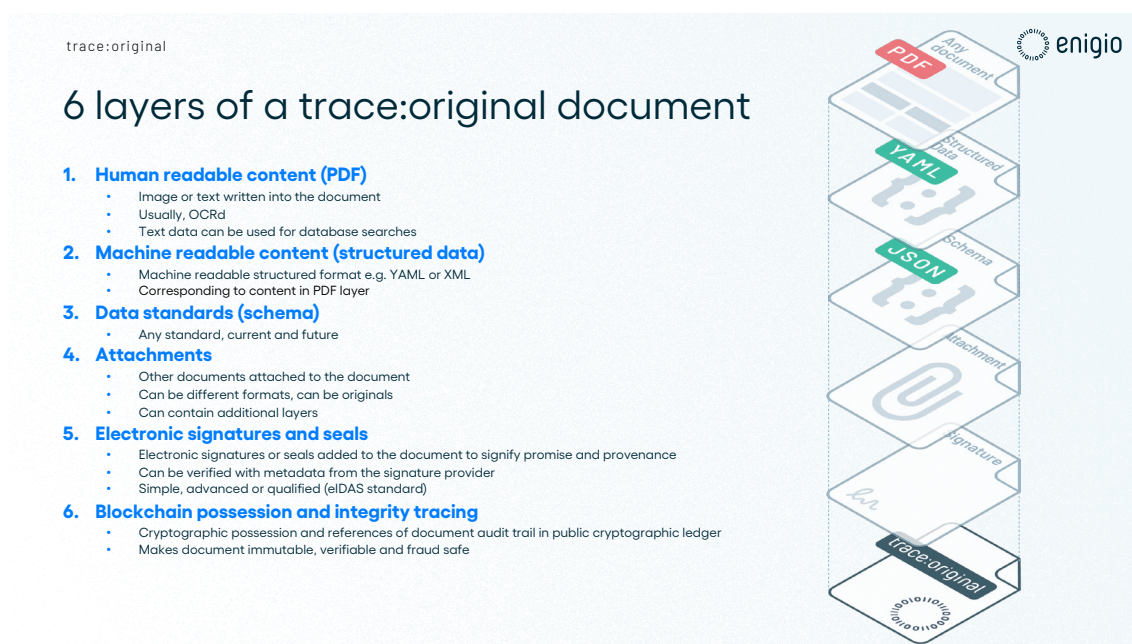
The impact

Eliminating the need for paper while simplifying operations and enhancing security

The shift to digital trade documents has delivered significant benefits for the company. By eliminating the need for physical courier services, the company has reduced transaction times and costs. The digital documents are easier to handle, verify, and share, leading to smoother operations across the board.

- **Reduced delays:** Transactions are completed faster without waiting for courier services which used to take one to four days each time documents need to travel between counterparties.
- **Cost savings:** Managing digital documents is less expensive than handling paper.
- **Simplified processes:** The solution integrated seamlessly with the company's existing systems, requiring no major changes.
- **Enhanced security:** Documents are easily verified, reducing the risk of fraud or error.

Figure 4: Six layers of key trade documents by Enigio that suffice various needs



Source: Enigio, 2024

“This is testament that Enigio’s trace:original is a solution for digitising all trade documents with integrity, security and control, whilst adhering to ICC frameworks like the ICC KTDDE. In addition, trace:original documents enable the document issuers to keep control of the layout and design of their own documents.”

Patrik Zekkar, CEO, Enigio

The logo for Air8, consisting of the word "Air8" in a white, sans-serif font, positioned in the upper left corner of a dark, blurred background image of a modern office interior with desks, chairs, and plants.

Digitalising and standardising for faster lending to SMEs

The challenge

Widening trade finance gap and the high costs of scaling fintech solutions

In the [ADB Trade Finance Gaps, Growth and Jobs Survey \(2023\)](#), it was revealed that the trade finance gap—requests and approvals for financing to support imports and exports—had widened to \$2.5 trillion, with SMEs in developing markets continuing to be the most affected. This is primarily due to low credit ratings and a lack of collateral for these SMEs when borrowing from banks and other traditional financiers. For large labour-intensive exporting countries, the consequences are detrimental, impacting both the domestic economy and the global value chain.

Fintech companies have risen to tackle this issue. However, those operating across a global footprint face challenges due to the variety of documents and templates, which significantly hampers operational processes and incurs high communication costs both internally and externally. The challenge, therefore, is to drive as much efficiency into the processes as possible to improve service standards and lower operating costs.

The solution

Standardising transactions for scale and improving efficiency in supply chain finance

Among supply chain finance fintech companies, Air8 has sought to scale and achieve cost efficiency through digitalisation and standardisation of operational approaches. As a fintech initiative under Li & Fung—a global supply chain orchestrator which offers end-to-end services for all stakeholders in the consumer goods industry, Air8 has strategically standardised their transactions within the Li & Fung ecosystem using a single template and outsourced processing activities. The standardised format used by Li & Fung for invoices, purchase memos, etc., greatly reduces the need for manual intervention, especially at the onset of a new financing relationship within the ecosystem.

As the number of clients on e-commerce platforms grows, Air8 maps out their outreach and connects with them via API. Since electronic points of sale (EPOS) and e-invoices on these platforms are digitally native, the need for format recognition is eliminated, greatly improving the overall turnaround time in processing transactions.

Air8 also relies on the [Zhong Deng website](#) in China for the electronic registration and verification of receivables. This central repository is useful as a form of risk mitigation against duplicate financing or fraud. The idea of a standardised digital central repository with verifiable origins will be very valuable in driving commercial opportunities and funding accessibility to markets.

The impact

Reduced transaction time and operational processes

Air8 conducted a study comparing transactions with standardised points of sale and invoices (linked to Li & Fung) against non-standardised transactions (outside the Li & Fung ecosystem). The results show significant differences in operational efficiency.

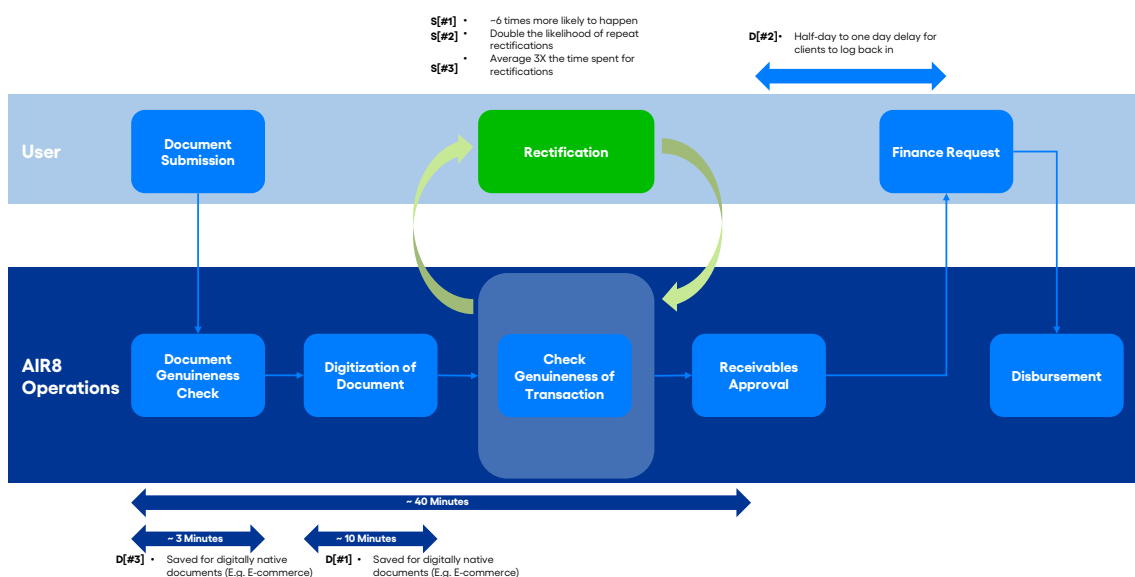
Standardisation:

- **Refer-back count:** Transactions outside the Li & Fung ecosystem had approximately six times more refer-backs due to document discrepancies compared to Li & Fung transactions, with 38% of transactions outside the Li & Fung ecosystem being referred back versus only 6% for Li & Fung transactions.
- **Average rounds of rectification:** Transactions outside the Li & Fung ecosystem required more rounds of rectification, averaging 2.3 rounds compared to one round for Li & Fung transactions.

Digitalisation:

- **Eliminating effort for data entry:** Digitising paper invoices takes approximately 10 minutes each. Eliminating this step could save 333 man-hours per month if 2,000 invoices are processed, equating to the workload of two operational staff.
- **Reducing time-to-money:** The time gap between uploading trade documents and availability for financing is eliminated with digital documents, improving the client experience and reducing the time-to-money.
- **Removing need for manual validation:** Digital platforms save time by eliminating the need to verify the authenticity of scanned or paper copies of orders and delivery statuses. Validating points of sale and invoices takes approximately three minutes per transaction. With 2,000 invoices processed monthly, 100 man-hours would be required for validation.

Figure 5: Transaction process with digitalised and standardised documents



Source: Air8, 2024

“As a growing fintech, speed and efficiency are the name of the game. As Air8 scales its international footprint, it becomes increasingly apparent that there is much to be desired in the consistency and interoperability of document or data. We see potentially marked difference in efficiency and user experience from digitalised transactions that we hope to see replicated in the global trade scene. I am confident that Air8 will grow from strength to strength as we ride on the coat tails of reputable international bodies such as ICC pushing ahead with the standardisation and digitalisation agenda.”

Erik Kwok, Head of Technology and Operations, Air8

NeXTRADE

Aligning master data in sales and procurement

The challenge

Ensuring accurate data before order placement from retailer to manufacturer

In the early 1990s, NeXTRADE faced the task of standardising and aligning company and product data between a major national division of a global food manufacturer and two major food retailers in Australia. The transition from paper and fax to Electronic Data Interchange (EDI) revealed significant issues with the quality of existing digital records. There were inaccuracies in company identification details, product data, and the application of barcodes to physical products at both retail and trade levels.

The solution

Auditing master data and correcting misalignments

To address these challenges, NeXTRADE initiated a comprehensive data cleanup and alignment process. The food manufacturer conducted an extensive audit of its product master file and developed software and scanning tools to verify 1,200 warehouse items. This audit uncovered significant misalignments, prompting an initiative to align barcoding with product records and relabel items as necessary. NeXTRADE ensured that company and product data, as well as barcode applications, were accurate before the first order was placed. Additionally, they aligned customer buyer files with supplier seller files, traditionally maintained manually from sales brochures, to streamline operations and reduce errors throughout the supply chain.

Custom software was created to analyse three years of sales history, providing reconciliation files to retailers who updated their records accordingly. Despite using different digital standards and secure networks, the manufacturer developed customised software to handle these variations. Once the data was clean and barcoding accurate, a test order was processed flawlessly, allowing the new EDI system to go live. The digital EDI system ran parallel with the paper-based system for 12 months, and within three months, it had proven its superiority in accuracy and completeness.

The impact

Solid time and costs savings with improved delivery performance

The alignment of master data between the food manufacturer and retailers resulted in tangible improvements:

- **Time saving:** Eliminating manual order correction efforts saves an estimated 10% on order product number corrections.
- **Optimised handling:** Ensuring order accuracy reduces incorrect warehouse picks and shipments, saving 15% on logistics costs due to fewer returns and double handling.

- **Cash flow:** Reducing discrepancies leads to significantly fewer unsettled invoices, lowering administration costs by at least 10%.
- **Delivery performance:** Increasing the Delivery in Full on Time percentage by 20% through reduced logistics errors and enhanced overall supply chain efficiency.

The EDI implementation between the major food manufacturer and retailers led to the need for company and product data verification, ensuring accuracy and quality of product master data and barcode applications, minimising errors and associated costs, and facilitating smoother transactions and better collaboration.

Today, after three decades of centralised third-party solutions for trade master data verification, the Web3.0 decentralisation approach, including artificial intelligence, offers the possibility of verifying master data at the source. This data can be discoverable and reused by authorised trading parties and authorities, ensuring continuous data integrity and operational excellence.



C

Digitalising cross-border regulatory compliance

In the dynamic landscape of global trade, the ability to navigate cross-border regulatory compliance efficiently is a key determinant of competitiveness. As trade barriers evolve and markets become more interconnected, the public sector's role in crafting enabling policies and fostering digitalisation is crucial to ensuring that businesses—especially SMEs—can thrive in this complex environment. By embracing standardised processes, leveraging digital tools and partnering closely with the private sector, governments can streamline compliance, reduce costs, and support the global competitiveness of their economies:

- **ASEAN Single Window (ASW):** Created a unified platform for seamless e-submission of cross-border regulatory documents across ASEAN member states, enhancing legal compliance, interoperability, and economic benefits, particularly for SMEs.
- **Dubai Trade:** Streamlined regulatory compliance by transitioning to an automated digital system, integrating key stakeholders into a Single Window platform, reducing time, cost, and complexity, and boosting overall efficiency and competitiveness.
- **DHL:** Simplified cross-border trade for SMEs through AI-driven tools that optimise pre-shipment planning, compare trade lanes, and ensure adherence to licenses and tariffs, leveling the playing field for smaller businesses in global trade.
- **Roanoke Insurance Group:** Digitalised customs bonds in the US market by integrating the bond filing process with major broker systems, reducing processing times, eliminating redundant data entry, and enhancing trade efficiency, benefitting importers and customs brokers.
- **ACITI:** Pioneered the concept of a modern Single Window system for Australia by leveraging existing supply chain data to automate customs compliance, significantly reducing repetitive data entry and offering substantial cost savings for businesses, enhancing Australia's trade competitiveness.

In conclusion, the digitalisation of cross-border regulatory compliance is not just a technological upgrade—it is a strategic imperative driven by strong public sector leadership, innovative private sector solutions, and a commitment to global standards. By creating an environment where standardised processes and digital tools are embraced, governments and businesses can work together to create more efficient, transparent, and competitive trade systems that empower all participants, particularly SMEs, to thrive in the global marketplace.



ASEAN Single Window

Integrating the National Single Windows through the harmonisation of technical solutions, business processes, and legal frameworks

The opportunity

Facilitate interoperability of data traditionally submitted in paper forms at regional level

For a tightly integrated trading bloc, a digital platform harmonising business processes, technical solutions, and legal frameworks has long been awaited. Given the volume and frequency of transactions between ASEAN Member States (AMS), the traditional way of obtaining, preparing, and submitting documents in paper forms to multiple places or systems has incurred massive costs and time losses for traders. With National Single Windows (NSWs) enabling e-submission of all documents at once, the ASW can facilitate interoperability of these data at the regional level.

The solution

Combining technical protocols with global standards of electronic documents

ASEAN has made collaborative efforts in standardising trade-related data and creating uniform rules for more than a decade. The vision of building a platform—the ASW—for trade information sharing across ASEAN was first initiated in 2005. It became fully operational when all 10 AMS established their respective NSWs and were ready to connect the systems in 2019.

In its development, ASEAN has agreed on technical protocols for end-to-end business processes through the ASW Steering Committee, which includes representatives from all AMS. Regarding standardisation, the data format of each electronic document was developed based on relevant standards developed by organisations such as the United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT), World Customs Organization (WCO), and International Plant Protection Convention (IPPC), and was agreed upon by all AMS before starting the exchange via the ASW. Legally, ASEAN signed the Protocol on the Legal Framework to Implement the ASW in 2015, identifying the necessary legal requirements to facilitate the exchange of electronic documents within the ASW environment. This protocol was fully ratified by all AMS in 2017. Lastly, governments have collectively promoted capacity building for customs officials and stakeholders to facilitate the reform.

The impact

Saving of 6 million business operation days and \$150 million in costs

All these efforts have led to a highly efficient cross-border paperless trade environment.

The current exchange covers:

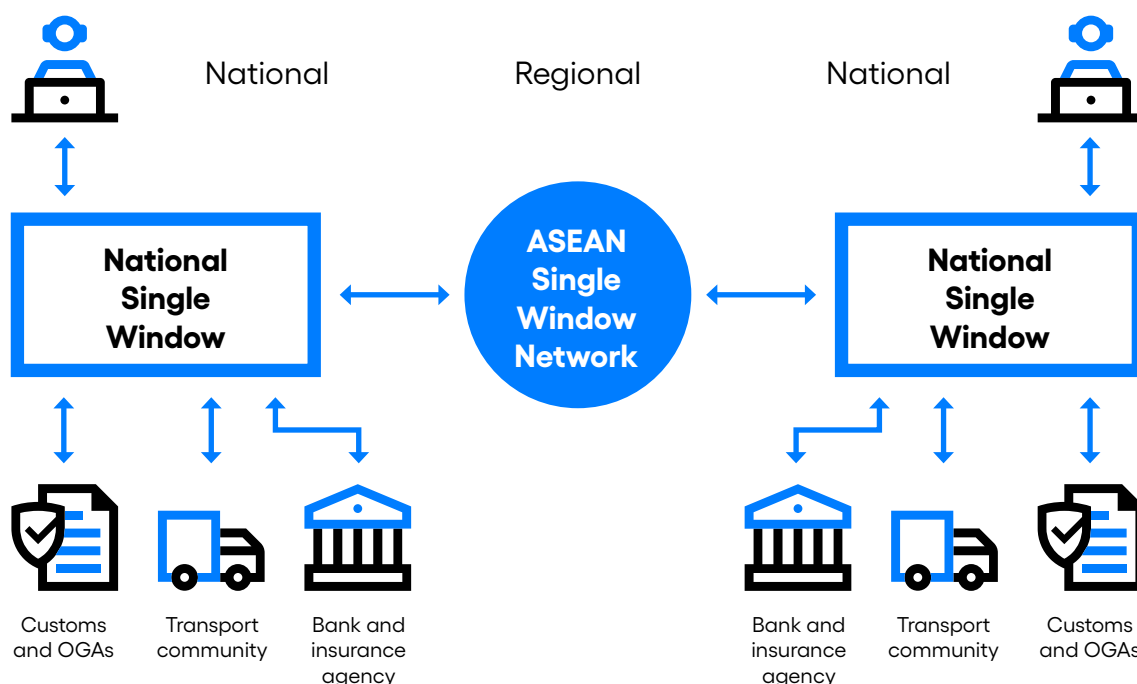
- ASEAN Trade in Goods Agreement (ATIGA) e-Form D through ASW,
- ASEAN Customs Declaration Document (ACDD) and
- Electronic Phytosanitary (e-Phyto) Certificates.

The on-going discussion includes:

- Electronic Animal Health Certificate (e-AH), and
- Electronic Food Safety Certificate (e-FS).

The list keeps expanding, and to date, ASW has significantly reduced transaction times and costs for the private sector, streamlined processes, and encouraged greater utilisation of the ATIGA. Over time, the number of ATIGA e-Form D submissions increased from 500,000 in 2019 to over 1 million in 2022, resulting in an estimated saving of 6 million business operation days and cost savings of \$150 million compared to using hard-copy documents.

Figure 6: Interaction among NSW, ASW, and other relevant authorities



Source: ASEAN Secretariat, 2024

"In Indonesia, the ASEAN Single Window has primarily been used for the electronic exchange of Certificate of Origin data under the ASEAN Trade-in Goods Agreement, replacing manual documents. As global trade accelerates, this solution holds the potential to facilitate the exchange of a broader range of trade documents. By simplifying trade administration processes, the ASEAN Single Window will drive significant savings in cost, time, and energy. Our goal is to expand the utilisation of this platform to encompass other trade documents within ASEAN and various Free Trade Agreement schemes".

Mr. Dedi Abdul Hadi, Deputy Director of Partnership Directorate, Indonesia National Single Window Agency

Dubai Trade

Revolutionising supply chain efficiency with Trade+ digital Delivery Orders

The opportunity

Enhancing Dubai's status as a global trade hub and strengthening Dubai's competitiveness with cutting-edge digitalisation

Trade+, an advanced digital solution designed to streamline the issuance of Delivery Orders (DO), is drastically reducing processing time and significantly boosting supply chain efficiency. The Delivery Order is a pivotal document in the import process, officiating the transfer of cargo ownership from carriers to Beneficial Cargo Owners (BCOs). Traditionally, this process has been bogged down by manual steps ranging from authorisations, exchange of documentation, to verification and payments—all of which are time-consuming and prone to errors. According to the World Bank, the process can take anywhere from 4 to 48 hours, leading to costly delays and inefficiencies in trade. These inefficiencies risk negatively impacting Dubai's competitiveness as a trading hub leading to poor customer experiences.

The solution

End-to-end digitalisation with Trade+ (digital DO)

The Dubai Trade Single Window, the region's leading single window platform for cross-border trade and logistics solutions is hosting services operated by Trade+ —a groundbreaking platform that fully digitalises the delivery order (DO) issuance process. This integration ensures a frictionless customer experience, streamlining operations for all stakeholders in local Sea and Air container shipments.

The customer journey is as follows:

1. Agents digitally submit the bill of lading and invoice information.
2. A digital cargo arrival notice is instantly sent to the notifying party.
3. The user logs into the Dubai Trade Single Window to use Trade+ services, reviews bill of lading and invoice charges, completes necessary details, uploads documents, makes an online payment, and receives instant payment confirmation.
4. The digital delivery order (DDO) request is verified and approved by the agent, and a DDO is automatically generated, with information seamlessly passed to customs to process/expedite the declaration process.

The impact

Trade+ streamlined operations leading to an 80% decrease in processing time, benefitting shippers, shipping agents and freight forwarders

TRADE+ with its digital delivery orders is a significant advancement for the trade & logistics sector in Dubai ensuring transparency across the supply chain and streamlining processes for all parties involved. Since its launch in 2020, over 47,000 companies and 467 agents have been onboarded. With Trade+, the DO issuance process has significantly shortened from a conventional nine step process to a much faster and simpler four step process.

The digital DO adoption rate exceeds 99%, with more than 65% of payments made digitally. This has led to an 80% decrease in processing time. Furthermore, the platform has processed invoices worth over 2 billion AED.

The environmental impact is significant as Trade+ has contributed to a reduction of 138,000 pounds of CO2 since its inception, based on the elimination of manual printing of delivery orders alone.

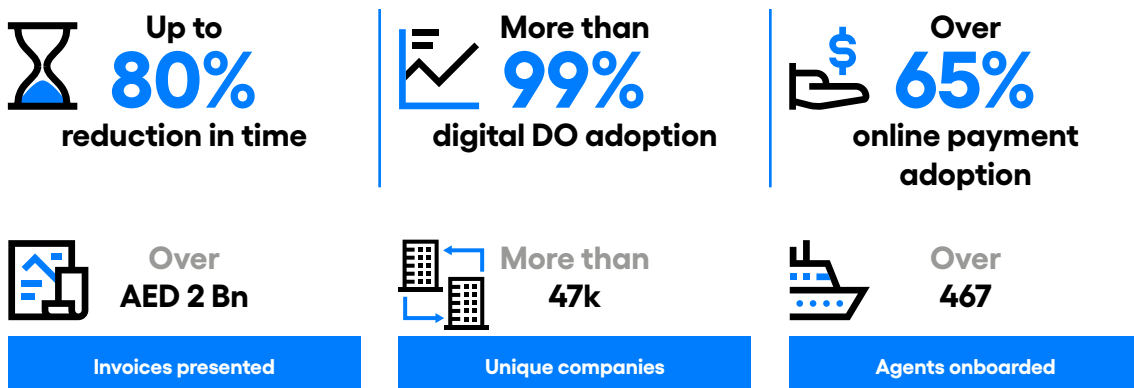
Benefits for shipping agents and freight forwarders:

- Convenient digital payment options
- Elimination of manual verification for offline payments
- Seamless document management

Benefits for BCOs:

- Instant payment confirmation on Dubai Trade
- Reduced payment processing time and faster (digital) DO release
- Enhanced shipment traceability

Figure 7: Efficiency enhancement with TRADE+ platform



Source: Dubai Trade, 2024

“The TRADE+ (Digital Delivery Order) platform is a game-changer in the Trade and Logistics sector in Dubai, driving unparalleled transparency, accountability, and competitiveness. This digital innovation is an addition to our relentless commitment to revolutionising trade through cutting-edge digitalisation, in perfect alignment with Dubai’s Economic Agenda D33. By seamlessly integrating key supply chain stakeholders and streamlining operations through our Single Window, we’ve not only amplified trade efficiencies but also played a pivotal role in propelling Dubai’s non-oil foreign trade to new heights.”

Mohamed AbuHamra, Chief Operating Officer, Digital Technology, DP World GCC

The DHL logo is positioned in the top left corner of the header image. It consists of the letters 'DHL' in a bold, white, sans-serif font. The background of the header image shows a yellow DHL delivery truck parked on an airfield with a modern city skyline in the background under a grey sky. A person in a high-visibility vest is walking near the truck.

Simplifying cross-border trade for SMEs

The opportunity

Addressing costly and complex information gathering for SMEs entering global markets

For SMEs entering global trade, accessing information on foreign market requirements can be both costly and complex. Many firms, lacking logistics and compliance resources, resort to hiring additional labor or outsourcing, which increases costs and puts them at a disadvantage. Information on export/import routes, estimated trade costs, and customs requirements is often scattered and based on individual firm experiences. According to the [World Trade Report \(2016\)](#), the difficulty in obtaining information on foreign market regulations is a significant barrier for SMEs, especially in developing countries.

The solution

Leveraging artificial intelligence and machine learning to simplify market requirements

DHL has addressed the challenge of facilitating trade by systematising information through a digital platform. In June 2024, DHL upgraded its Trade Automated Service to the My Global Trade Services platform (MyGTS), providing new features to assist businesses in accessing new markets. MyGTS is an online self-service portal that allows users to easily retrieve customs information to pre-plan shipments. It incorporates artificial intelligence and machine learning to provide estimated duties/taxes, which are included in the landed cost of different trade lanes. The platform also includes a “trade lane comparison” feature that enables businesses to reference existing customs requirements between exporting and importing countries or territories. This empowers companies to make well-informed decisions when planning a market expansion strategy, maximising efficiency and helping them gain a competitive advantage.

Furthermore, as part of DHL’s commitment to supporting SMEs in developing and least developed countries, the company is running its DHL GoTrade initiative. Part of DHL GoTrade activities is the provision of training on international trade, logistics requirements, customs compliance, and eCommerce fundamentals. Since the launch of the initiative in 2020, more than 6,300 SME entrepreneurs have already participated in such training sessions.

The impact

Empowering businesses with reliable information to define go-to-market strategies

Systematising trade information has empowered SMEs to better compete in the global market alongside larger companies. With trade lane comparison, businesses can identify routes offering the most favourable import and export conditions, leading to potential cost savings and increased profitability. The pre-shipment plan functionality, including HS code classification options to users, reduces clicks by up to 50%, saving valuable time for fulfillment operations.

For importers:

- Identify examples of import licenses or permits that may be required when sourcing materials from different vendors.

For exporters:

- Stay informed about export and import customs requirements for products they wish to ship to destination countries or territories.
- Define go-to-market strategies and strategically position themselves in new markets.

Overall:

- Aids in market penetration and reduces reliance on single-sourcing locations.
- Supports corporate globalisation trends, providing SMEs with tools to navigate overseas markets and expand their international presence.

Figure 8: MyGTS overview and benefits

My Global Trade Service (MyGTS)

EVERYTHING YOU NEED FOR CROSS-BORDER TRADE NOW ON MY GLOBAL TRADE SERVICES

Navigate international trade regulations in **227** countries and territories

How was it done before?

- 20-year-old application called Trade Automated Service (TAS)
- Unsatisfactory user experience
- No AI Machine Learning to support classification of products

Access to 4 types of trade content

- Document templates
- Import and export requirements
- Landed costs
- Tariff classification

5,169 downloadable export and import document templates

Benefits for us and the customers

- MyGTS can be used by DHL stakeholders or our customers
- MyGTS enables users to be aware of estimated costs which can help customers with their pricing plans and importing / exporting decisions
- Adobe analytics key metrics reporting is in place
- Market integration to investigate possible sales leads is active

Source: DHL, 2024

“Companies including SMEs are doing what they can to boost business resilience and global presence. However, SMEs tend to be impeded by the intricacies of trade regulations and processes, slowing down their expansion plans. The new trade lane comparison capability helps SMEs enhance their understanding about customs requirements and landed cost. It aligns with our commitment to providing innovative solutions to help SMEs lower major trade barriers and become more confident in cross-border trade activities.”

Yung C. Ooi, Asia Pacific Senior Vice President for Commercial, DHL Express



Roanoke Insurance Group Inc.

Enabling smooth compliance with electronic customs bond in the US market

The opportunity

Overcoming the challenge of harmonising metadata schemes and public-private collaboration

While many countries have adopted customs bond systems and promoted e-bonds, harmonising metadata schemes for sharing among the bond principal (importer), obligee (customs), and surety (insurance company) remains a major hurdle. Additionally, fostering collaboration between the public and private sectors is challenging. For example, the US converted paper bonds to e-bonds in 2015, involving two systems: the US Customs and Border Protection (CBP)'s Automated Commercial Environment (ACE) for bond submission, and the bond issuing system managed by surety companies/surety agents. Due to the lack of integration between these systems, brokers often face challenges in establishing a seamless connection, resulting in redundant data entry and procedures.

The solution

Streamlining e-bond processes for brokers by facilitating more efficient data exchange

Roanoke Insurance Group Inc. was instrumental in the development and deployment of electronic customs bonds in 2015. By developing the bond issuing platform FastBond™, Roanoke enabled customs brokers to file bonds electronically with response times measured in seconds. To avoid unnecessary back-and-forth between systems, Roanoke integrated FastBond™ with customs broker, facilitating efficient data exchange between brokers and CBP. Roanoke collaborated with several major customs broker software to create seamless integrations with FastBond™, eliminating the need for duplicate data entry.

The impact

Enhanced efficiency, reduced errors, and improved client retention for customs brokers

The advantages to all stakeholders in the import process are significant and measurable.

- **Seamless online bond management:** US and Canadian customs brokers can issue and manage various bonds online, streamlining the process and improving efficiency. Integrating with customs broker software improves control over workflow, reduces data errors, and allows seamless bond transactions.
- **Simplified filing:** Transitioning from paper to e-bonds in the US has made the bond filing process faster and more efficient, aiding in the digitalisation of customs broker services and improving customer experience for importers.

- **Cost-effective risk mitigation:** Annual customs continuous bond premiums are around averaged \$130 million annually between 2018-2022 per the Surety and Fidelity Association of America. CBP reported in fiscal year 2023, US imports totalled \$3.33 trillion that were covered by customs bonds having estimated duties, taxes and fees totalling \$92.3 billion. These premiums are only 0.14% of estimated duties or 0.0039% of the value of imported goods. In contrast, fees associated with a bank guarantee or letter of credit can range between 0.75%—3.0% of the letter of credit amount per year, often requiring 100% collateral, which restricts the importer’s cash availability.
- **Efficient revenue collection:** From 2020-2023, 73% of payments made to customs from sureties covered duties, taxes, and fees. The bond system ensures the government collects revenue even if an importer goes out of business, allowing immediate release of goods from customs.

Figure 9: Three steps of an eBond transfer



Source: Roanoke, 2024

In a very simple illustration, the surety client (usually customs broker) enters/transmits bond data to the surety/surety agent. The surety/surety agent sends the required data to CBP and a response is sent back to the surety/surety agent from CBP.

“The development of eBond for customs bonds simplified the process of filing paper or PDF bonds with CBP allowing our staff to better serve our clients. The paper-based process would take weeks to have a bond processed. With eBond, we learn within minutes that the bond is on file.”

Jennifer Rome (Vice President) and Colleen Clarke (Senior Vice President), Roanoke



ACITI

Developing a Single Window system for the 21st century with KTDDE core data

The opportunity

Accelerating trade digitalisation to keep pace with trading partners

The global shift towards digitalisation is evident as companies across the supply chain adopt new technologies for faster and safer trade. Beyond these stakeholders, civil society plays an indispensable role in driving progress and advocating for reshaping the future of international trade. According to the [World Economic Forum \(2023\)](#), SMEs account for more than 90% of businesses and over 50% of employment worldwide. However, their participation in international trade is limited, with little influence on promoting changes that reverse traditional practices. This reluctance to change stems from various internal and external factors. For SMEs, it involves reallocating funds and restructuring business strategies. In many countries, the environment may lack supportive legal frameworks, technical infrastructure, and financial accessibility. Thus, the civil society aims to push for government capacity building, providing the necessary conditions for SMEs to accelerate the transition.

One significant focus for many governments is establishing a Single Window system, allowing individual data elements required for trade-related compliance to be submitted only once.

International organisations have worked on designing standards for this, with:

- The United Nations Economic Commission for Europe (UNECE) detailing the Single Window concept in Recommendation 33;
- The Trade Facilitation and E-Business UN/CEFACT Business Requirements Specification on Data Pipeline Carrier outlining and standardising the information entities of the Data Pipeline Carrier, based on the Multi-Modal Transport Reference Data Model;
- The ICC DSI KTDDE initiative identifying the individual data elements required for 36 trade processes and associated documents across the supply chain.

Despite the existence of these standards, a gap remains between the theoretical framework and ground-level implementation. For instance, in the most recent survey on ease of crossing the border in 2020, Australia ranked 106th globally, down from 27th a decade earlier. The industry is concerned that Australia's border-crossing procedures have not kept pace with trading partners and are inconsistent with its commitments to trade facilitation and digital economy approaches outlined in the WTO Trade Facilitation Agreement (TFA) and various bilateral and regional trade agreements. In 2021, the Australian Government created the Simplified Trade System Taskforce to address industry concerns and propose reforms to enhance Australia's international competitiveness. However, issues such as coordination among government agencies and low SME access to the Single Window remain unaddressed, as highlighted by the [UN Global Survey on Digital and Sustainable Trade Facilitation \(2023\)](#).

The solution

Reusing data from supply chains to fulfill most customs requirements automatically

Independent non-profit organisations like the Australian Centre for International Trade and Investment (ACITI) are bridging this gap by providing research analysis and business consultancy to both the government and companies. These organisations bring policy insights and industry expertise closer to traders. For example, following the ICC DSI KTDDE's publication covering 36 key documents, ACITI conducted data analysis to make the findings more accessible. They focused on the requirements of a customs declaration, identifying the necessary data elements and their occurrence across the supply chain.

The results showed that:

- About 70% of the data elements are used by the government, and 30% are used exclusively by the private sector.
- 77% of data elements needed for a customs declaration occur in the initial stages of a commercial trade transaction.
- 17% of data elements are related to government-issued export/import licences or organic certifications, obtained before the trade event begins. Including Certificates of Origin (issued by the government or approved bodies). These account for 90% of the 77%. This has implications for the “tell-us-once” approach required for Single Windows, as the data has already been sought and acquired through government processes before the customs system is involved.
- 23% of the data elements needed for a customs declaration occur in the logistics stages of the supply chain or direct engagement with customs processes, such as advanced rulings, customs bonds, etc.

The impact

Reduced paperwork and preparation efforts could bring thousands to millions in savings

As nations strive to implement or improve Single Window systems, the key question is: what is the model for a Single Window in the 21st century? UNECE Recommendation 33 provides guidance, stating that a Single Window is not merely an IT system but a system that “aims to expedite and simplify information flows between trade and government and bring meaningful gains to all parties involved in cross-border trade.”

The KTDDE initiative identifies the data elements and their locations within the supply chain, supporting the creation of a data pipeline necessary for commercial transactions. This approach eliminates the need for data to be repeatedly sought by government agencies and commercial partners. Additionally, UN Recommendation 49, the UN Transparency Protocol, offers a method for data to be “pulled” from its location within the common systems that businesses use, rather than being “submitted” to a government agency or other user. Combining the insights from KTDDE with UN Recommendation 49 offers a significant enhancement to the vision of a Single Window fit for the 21st century where paperless trade becomes a reality.

Reduced paperwork and preparation efforts can translate into substantial savings for businesses.

- Smallholders in developing Asia could save approximately \$1,000 to \$2,000 annually by reducing paperwork, associated labour, paper, printing, and courier fees.
- Regular traders handling around 10,000 containers annually could achieve cost savings of up to \$3 million per year (\$300 per container).

"I can now see that the data I use for my initially commercial dealings—the contract, purchase, order and invoice, that are resident in my accounting system—form the basis of the data pipeline that allows me to automatically demonstrate compliance for all manner of compliance requirements from payments through to tax compliance and beyond, without the need to repetitively fill in forms and provide data."

Bryan Clark, Director, Clark and Kealey Distilling Pty Ltd.





D

Digitalising financial services and fraud prevention

In the fast-paced world of global trade, the digitalisation of financial services and the implementation of robust fraud prevention mechanisms are crucial for ensuring secure, efficient, and transparent transactions. As businesses increasingly rely on digital platforms to manage trade finance and mitigate risks, the integration of innovative technologies and standardised data has become essential for maintaining trust and competitiveness in the financial ecosystem:

- **Hong Kong Monetary Authority (HKMA):** Developed the Commercial Data Interchange (CDI) to streamline loan approvals for SMEs by enabling secure, consent-based data sharing, improving speed, accuracy, and access to finance.
- **XDC Trade Network:** Enhanced trade finance liquidity in the India-UAE trade corridor by implementing digital identities, electronic promissory notes (ePN), Legal Entity Identifiers (LEI), and the TradeTrust framework, addressing cash flow challenges for Indian traders.
- **ICICI Bank:** Digitalised its trade finance process/Letters of Credit (LC) lifecycle by leveraging many technologies. One among them is Swift's FileAct, a secure channel which streamlines movement of document from customer to bank and bank to customer.
- **Vale International and HSBC:** Modernised trade finance operations with HSBC by using eBL under Letters of Credit (LC), reducing turnaround times and operational costs, with 46% of its total volume processed electronically by September 2023.
- **MonetaGo:** Developed a digital platform leveraging Legal Entity Identifiers (LEI) to combat fraud in trade finance by preventing duplicate financing and invoice fraud, significantly increasing trust and efficiency in financial transactions.
- **Afreximbank:** Developed the Africa Trade Gateway (ATG), a comprehensive digital trade ecosystem that integrates key services and provides a secure environment for cross-border transactions, leveraging verified data for supply chain finance and market intelligence.

These case studies illustrate the transformative power of digitalisation in financial services and fraud prevention. By embracing innovative technologies and standardising data, financial institutions and businesses can achieve greater efficiency, security, and transparency in trade finance, ultimately strengthening the global trade ecosystem and ensuring sustained growth and competitiveness.



Hong Kong Monetary Authority and Commercial Data Interchange

Enhancing consent-based data infrastructure to streamline loan approval for SMEs

The opportunity

Enhancing consent-based data infrastructure to facilitate trade data sharing at scale

Lack of digital infrastructure has always been a significant hindrance to fulfilling the digitisation of trade. In October 2022, the HKMA took the initiative to launch the CDI, a key initiative under 'Fintech 2025' strategy, aimed at enhancing Hong Kong's consent-based data infrastructure. This infrastructure facilitates data sharing and opens up more opportunities for fintech solutions.

Among all participants, Tradelink Electronic Commerce Limited (Tradelink), as an e-solution and service provider for SMEs, is one of the beneficiaries through its partnership with CDI. Tradelink's major clients are SMEs, which have traditionally faced obstacles due to redundant loan processes. This challenge is especially acute for SMEs competing in the same market as big enterprises, which typically enjoy greater credibility with banks, thus receiving easier access to financial services and liquidity. SMEs may find it difficult and time-consuming to manually consolidate and submit supporting documents such as financial statements and paper-based customs declarations to banks. Meanwhile, banks encounter challenges in verifying the sources and authenticity of these documents.

The solution

Joining up digitalised trade declaration data with banks' loan assessment data needs

By joining CDI as a data provider, Tradelink—Hong Kong's pioneering provider of Government Electronic Trading Services—can securely share digitalised, standardised and structured trade declaration data with banks, with the consent of its clients. This minimises the need for SMEs to consolidate and submit paper-based supporting documents to banks. The digitalised data from Tradelink provides banks with insights into the trade value and operational scale of SMEs, enabling better understanding of their current operating conditions and business prospects, thereby streamlining the loan approval process.

The impact

Reduced time required for loan approval from months or weeks to days

- CDI has facilitated over 27,000 loan applications and reviews,
- Estimated credit approval amount exceeding HK\$23.8 billion as of end of June 2024.
- Time required for loan approval has been reduced from months or weeks to days for SMEs.
- Empowered banks to make credit decisions using various types of alternative data, minimising the need for loan collateral.
- Simplifies SMEs' access to financing, further unlocking the potential of the Hong Kong market.

"We are delighted to participate in HKMA's CDI initiative, sharing our customers' trade declaration data with banks to facilitate loan services for SMEs that otherwise struggle to access such services. We are pleased to witness the benefits this brings to our customers and anticipate sharing more alternative data to create further value for the entire Hong Kong trading community."

Tommy Yuen, S.B.S. Chief Executive Officer-designate, Tradelink Electronic Commerce Limited

"Applying for a loan through CDI makes documentation and processes much simpler, and there is no need to provide collateral."

Johnny Mak, Founder and CEO, KICKS CREW



XDC Trade Network

Facilitating faster access to trade finance liquidity with digital identity and digital Promissory Note

The opportunity

Improving cash flow and boosting trade volumes for traders in the India-UAE corridor

Trade volume is on the rise after India and the UAE signed a contract for a trade corridor. However, this deepened cooperation has not been well supported by faster digital infrastructure. Typically, when a trader in Nashik, India, exports fruits and vegetables to the UAE, the trader must pay local farmers upfront due to business requirements, while the payment terms with the UAE buyer are 15 days from the shipment date. This creates a cash flow gap and restricts the number of trades. Constantly using personal funds leads to financial strain and reduced opportunities. The root cause of these issues is that the movement of trade documents through couriers takes too long.

The solution

Adopting standardised digital documents, digital identity and interoperable frameworks

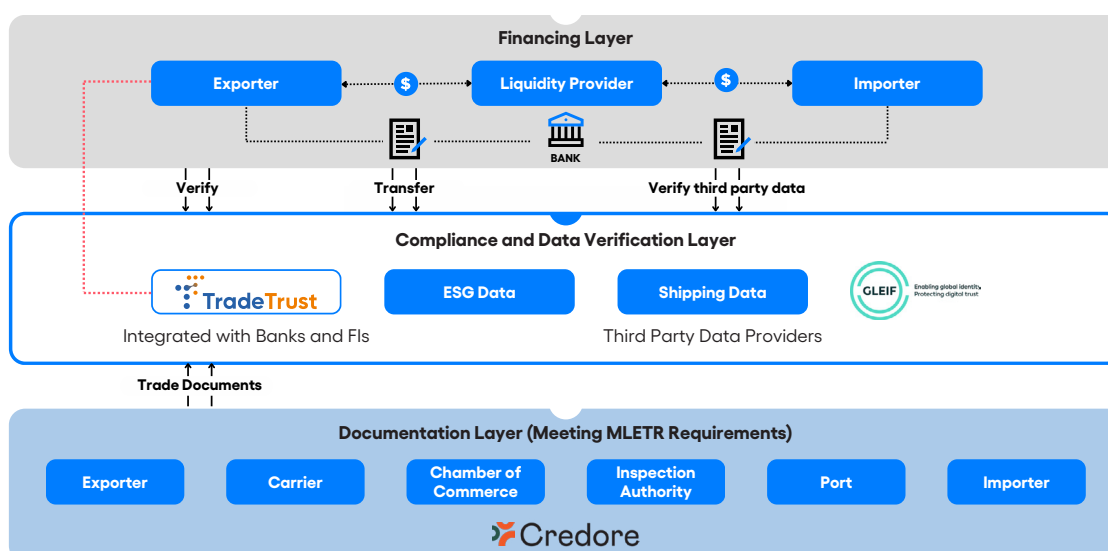
XDC Trade Network has addressed this by adopting digital methods. XDC aligns with UNCITRAL MLETR guidelines and offers a solution to create any trade document in a digitised format recommended by the KTDDE Framework. It has partnered with Credore, an IT infrastructure provider in India, to issue e-documents such as Promissory Notes, BLs, purchase orders, commercial invoices, and shipment booking documents, etc. With this shared data, XDC Trade Network creates a marketplace for shippers to present these trade documents and seek trade finance. These presented documents can be verified over Singapore Infocomm Media Development Authority's (IMDA) TradeTrust and other registries by liquidity providers. Additionally, using the LEI from GLEIF ensures instant verifiability of the companies and decreases the risk of fraud and misidentification of the parties. Once the documents are verified, the exchange of documents for trade finance is completed securely using a regulated custodian.

The impact

Reduced transaction time to minutes on top of a more streamlined and reliable KYC process

- **Reduced transaction time:** Traditionally, a physical paper-based Promissory Note would take three to five days from instrument preparation to sending to the drawee and a few more days to obtain the required trade finance. The 100% digital process has reduced the movement of documents from days to a few minutes.
- **Streamlined KYC process:** Digital documents and LEIs enable quick and reliable verification of company identities compared to days and even weeks previously with paper documents from different countries, reducing fraud and ensuring transparency for liquidity providers.
- **Long-term benefits:** Enhanced business volume and scalability between India and the UAE, supporting faster cash flow and greater profitability for traders.

Figure 10: Trade process with digital methods



Source: XDC Trade Network, 2024

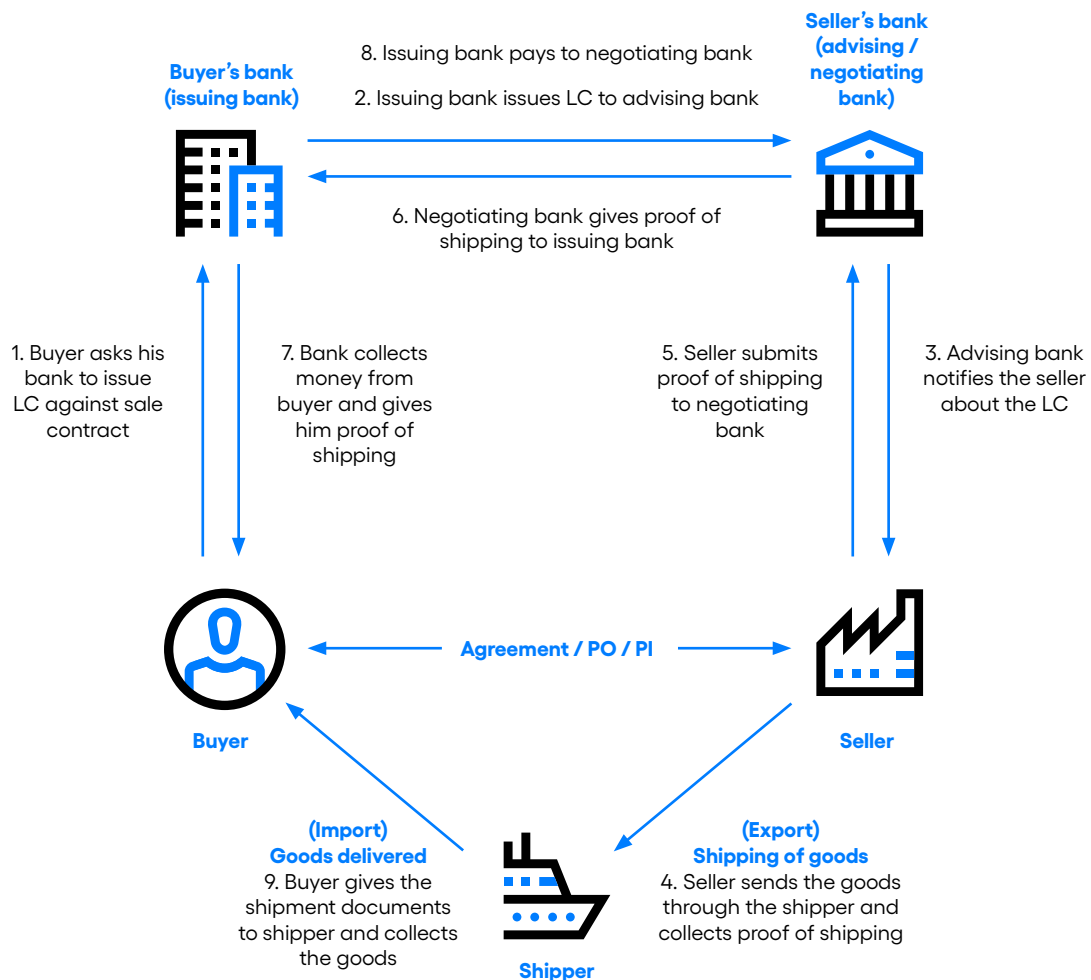
Swift and ICICI Bank Digitalising the Letter of Credit

The opportunity

Modernising Letters of Credit (LC) process to provide seamless services to clients

The LC process, a cornerstone of international trade, has long been encumbered by complexities and resultant time outlay. Traditional paper-intensive processes have hindered banks' ability to provide seamless and instant services at times to their clients. ICICI Bank—a leader in digital banking—recognised this challenge and embarked on a transformative journey to digitalise the LC lifecycle.

Figure 11: LC digital data transfer in trade



Source: Swift and ICICI Bank, 2024

The solution

Digitalising LC issuance process for enhanced efficiency

As a pioneer in digital banking in India, ICICI Bank is at the forefront of various initiatives. ICICI Bank is one of the first banks in India to adopt innovative solutions to streamline cross-border transactions.

In line with this commitment, ICICI Bank is digitalising its trade finance process by leveraging many technologies. One among them is Swift's FileAct, a secure channel which streamlines movement of document from customer to bank and bank to customer.

The impact

Delivering greater value to clients while enhancing operational excellence

By adopting an array of digital solutions for digitalising LC transactions as above, ICICI Bank has been able to:

- Reduce turnaround times for LC document delivery to immediate, thereby improving service quality and client satisfaction.
- Lower operational costs through streamlined digital processes.
- Improve transparency and record audit trails.
- Enable clients to make faster execution of contracts and improve the working capital cycle.

"ICICI Bank has a rich legacy of leveraging the latest technology to bring in new paradigms in cross-border banking. We have leveraged several technologies including Swift's FileAct to digitise and streamline the paper-intensive LC transactions. Collectively, these initiatives have simplified our LC processes, reduced turnaround time and enhanced customer experience. We believe these improvements are valuable contribution to making international trade more efficient."

Anubhuti Sanghai, Head Transaction Banking, ICICI Bank

"By harnessing Swift's advanced infrastructure, defined by standardised messaging and robust security protocols, the financial ecosystem can overcome traditional complexities associated with the processing of Letters of Credit. Swift is dedicated to future-proofing the industry, connecting institutions globally with secure and reliable data-sharing capabilities and empowering banks to provide seamless trade finance solutions."

Avanee Gokhale, Global Head, Trade Strategy, Swift



Vale International and HSBC Electronically presenting Letters of Credit using electronic Bills of Lading

The opportunity

Modernising trade finance for enhanced efficiency and cash flow

As a global mining leader, Vale aimed to digitalise their Documentary Credits (DCs) to improve document security, operational and cash flow efficiencies. Based in Malaysia, Vale's Global Trade Finance handles all receivables related to documentary credit collection. Recognising the need for safer documentation flow, quicker turnaround times and better cash flow management, Vale sought a digital solution that could:

- Reduce exposure to risks related to letters of indemnity for both Vale and its clients.
- Enhance processing speed to improve cash flow management.
- Bring strong partnership with a global bank experienced in digital platforms and electronic presentations.
- Bring clients to partake digital transformation through adoption of electronic presentations (e.g., eUCP, eBL).
- Meet regulatory requirements for electronic transactions.

The solution

Digitalising DC transactions with electronic presentations

To overcome these challenges, Vale partnered with HSBC and other banks to implement electronic presentation under DCs using ICE Digital Trade (IDT), formerly known as essDOCS. Bringing clients and convincing buyers in adopting the new flow and navigating competitive and regulatory landscapes were significant hurdles. However, a robust digital solution and a strong partnership with HSBC ensured a smooth transition and successful implementation.

By September 2023, 46% of Vale's LCs received were processed electronically. This shift not only enhanced operational efficiency but also demonstrated the effectiveness and reliability of innovative digital solutions.

The impact

Delivering enhanced efficiency and cash flow management

The adoption of digital solutions for Documentary Credit transactions provided Vale with numerous benefits:

- **Risk mitigation:** lowered usage of letters of indemnity for discharge by 20% since 2020.
- **Paperless operations:** By digitising documents, electronic LC presentations eliminate the need for physical paperwork. This reduces administrative overhead and the environmental impact associated with paper use.
- **Enhanced security:** Reduced risk of tampering or loss with secure electronic presentations which include security features such as encryption and electronic signatures. This will protect and help sensitive information to be kept well and authenticated.
- **Faster payment processing:** Reduced turnaround times for payment cycles [from eight days to six days] significantly and reduced time for banks to review and approve documents.
- **Faster payments:** Enhanced liquidity that improves cash flow and working capital efficiency.
- **Instant Transmission:** Documents can be transmitted electronically in real-time, eliminating the delays associated with physical courier services.
- **Customer Experience:** improved customer experience with a faster turnaround time on DC processes.

“The digital transformation of our LC transactions has significantly improved cash flow and operational efficiency. This partnership with HSBC has been instrumental in achieving our digital adoption goals.”

Bruno Sales, Finance Services General Manager, Vale

“HSBC Global Trade Solutions has been instrumental in the end-to-end digitisation of Documentary Credits globally. We are delighted to be a trusted partner for our clients, supporting their digitisation ambitions and to bring efficiencies to their businesses.”

Venkatraman P, Managing Director, Head of Products and Propositions—Asia Pacific & Global Head of Core Trade, GTS, HSBC



AFREXIMBANK

Africa Trade Gateway (ATG) —Empowering African Trade under the African Continental Free Trade Agreement (AfCFTA)

The opportunity

Tackling trade fragmentation using digital tools

The African Continental Free Trade Agreement (AfCFTA) is a transformative initiative, representing one of the largest free trade areas in the world, with a market of 1.4 billion people and a combined GDP of \$3.4 trillion, which could significantly reshape Africa's trade and economic landscape. It aims to unlock significant economic potential, increase Intra-African trade, and position Africa as a key player in global commerce. However, to fully realise these benefits, Africa must overcome key trade barriers such as fragmented markets, complex trade processes, limited access to finance, and diverse regulatory environments.

For many African businesses, particularly SMEs, these challenges pose significant barriers to engaging in cross-border trade. The need for unified and streamlined processes to reduce costs, improve access to markets and financing has become increasingly critical. The Africa Trade Gateway (ATG), developed by the African Export-Import Bank (Afreximbank) and in collaboration with the AfCFTA, addresses these needs.

The solution

Streamlining trade: B2B commerce, due diligence, market intelligence and access to financing

The ATG is a trusted trade ecosystem designed to support end-to-end trade transaction, making it easier for commercial banks, their customers and other trading businesses across and out of Africa to connect, trade, and grow. The ecosystem leverages comprehensive and evolving digital trade-enabling products and services which include:

1. **ATG for e-commerce (Africa Trade Exchange—ATEX)**—a secure e-commerce solution for businesses to access verified African and global suppliers, connect with financial institutions for trade finance, and use secure payment and logistics solutions, ensuring seamless transactions from start to help them navigate and benefit from the AfCFTA.

2. **ATG for due diligence (MANSA Digital Initiative)**—is the first Pan-African Centralised Due Diligence Repository Platform supporting business counterparts to easily conduct due diligence checks by providing a single source of verified primary KYC data on African entities. Launched in 2020, the repository is exponentially growing with financial institutions, corporates and SMEs heeding the call to get MANSA verified and access a continuum of benefits. MANSA-verified entities are equipped with an Africa Entity Identifier (AEI) code to leverage and facilitate trade across Africa and the rest of the world and promote transaction and payment transparency.
3. **ATG for market intelligence (TRADAR)**—provides businesses with vital market insights, including trade flows, investment opportunities, and regulatory information, empowering them to make informed decisions, identify new opportunities, and strategically plan their market expansion.
4. **ATG for financing, investments, freight & logistics (ATG Connect)**—serves as a matchmaking hub, linking businesses with financiers, investors, logistics providers, and contractors, thus facilitating efficient scaling of operations.
5. **ATG for supply chain finance solution**—Afreximbank Tradelink compliments the ATG and enables SMEs to benefit from better financing terms by leveraging the creditworthiness of large corporate buyers in partnership with Afreximbank and local banks, ensuring liquidity and supporting business growth without cash flow constraints.
6. **Digital solutions for payments**—powered by the Pan African and Payment Settlement System (PAPSS) to simplify cross-border payments by enabling instant transactions in local currencies, reducing the complexities and costs for businesses to operate across Africa's diverse markets. It is designed to effect instant payments in local currencies and use Central Banks or Commercial banks as settlement agents. PAPSS connects Central Banks, commercial banks, payment services providers, and governments to streamline intra-African trade, making it faster, more affordable, and more inclusive. Currently, the PAPSS network includes 14 Central Banks, 11 switches, and over 130 commercial banks across Africa.

The impact

Empowering more participants in trade

The ATG is transforming how trade is conducted across Africa by addressing key barriers to intra-African trade and directly supporting the implementation of the AfCFTA. Its impact is evident in several areas:

- **Increased trade participation:** By bringing together banks, importers, exporters and other cross border businesses, the ATG enables African businesses to accelerate their trading activities within the continent and with the rest of the world through simplified trade processes and lowers barriers to entry particularly for SMEs to participate in cross border trade.
- **Enhanced market access:** Tools like ATEX and TRADAR open new markets for African businesses, aiding in their growth and diversification, which is crucial for driving economic development across the continent.
- **Improved financial inclusion:** ATG connects businesses with a variety of financial institutions and offers innovative trade finance solutions, addressing the critical challenge of access to finance that has long hindered growth for African businesses.

- **Streamlined trade processes:** The digital solutions provided by ATG, such as MANSA and PAPSS, reduce the time, cost, and complexity of conducting trade, enhancing the competitiveness of African businesses on the global stage.
- **Support for AfCFTA objectives:** ATG plays a crucial role in enabling a more integrated and efficient trade environment across Africa, empowering businesses to seize new opportunities created by the AfCFTA and fostering economic integration.

“The ATG’s ‘one window’ approach is not just transforming trade processes; it is a strategic move by Afreximbank to build a robust digital future, empowering commercial banks, their clients (importers and exporters) and other cross-border trading entities to harness the unprecedented market opportunities created by the AfCFTA fully. By simplifying interactions, fostering trust, and reducing operational costs, we’re enabling more businesses to engage effectively in cross-border trade and investment. Through the ATG, entities can register to find deals, connect with financiers, and explore new markets seamlessly, thereby advancing the future of Africa’s trade and economic landscape.”

Haytham EIMaayergi, Executive Vice President, Afreximbank Global Trade Bank



MonetaGo

Leveraging standardised data points to alert financiers of potential fraud

The challenge

Delivering tech-enabled, privacy-respecting data sharing to prevent trade finance fraud

On a global scale, cases of fraud in trade finance are increasing, while limited solutions and technologies exist to mitigate the risks in the early stages. In 2020 alone, reported trade finance losses exceeded \$10 billion due to fraudulent documents, collateral fraud, and duplicate financing. Most efforts to tackle fraud have not been tailored to international, cross-border risks but were designed for closed ecosystems that could only mitigate risk within narrowly defined digital islands or domestic boundaries.

At the micro level, several challenges exacerbate the issue. First, data privacy restrictions prevent financiers from legally sharing customer-related information, which complicates the detection of duplicate financing fraud. Additionally, regulatory differences, internal practices, and system capability disparities create fragmentation in document information capture and processing. Because of the lack of standardisation, it is difficult for financial institutions to agree on the metadata schematics associated with trade documents, leading to inaccuracies and inefficiencies. Therefore, complex ecosystems and interbank systems require an interoperable solution that can function with minimal user disruption.

The solution

Combining data standards with API connectivity and digital identities

MonetaGo developed the first in-production utility for lenders to de-risk global trade finance by leveraging these components:

- **Transforming data:** Leveraged KTDDE digital standards, UN/CEFACT and DCSA standards for trade document schematics.
- **Setting up for interoperability:** Utilised OpenAPI 3.0 for efficient API connectivity, enabling vast networks to understand and interact with each other.
- **Standardised identity:** Advocated for LEI and invested in W3C decentralised identifiers specifications for future-proofing identity validation across regions.
- **Build partnerships with lender networks:** Partnered with organisations like SWIFT, enabling the solution to reach over 11,000 financial institutions worldwide.

The impact

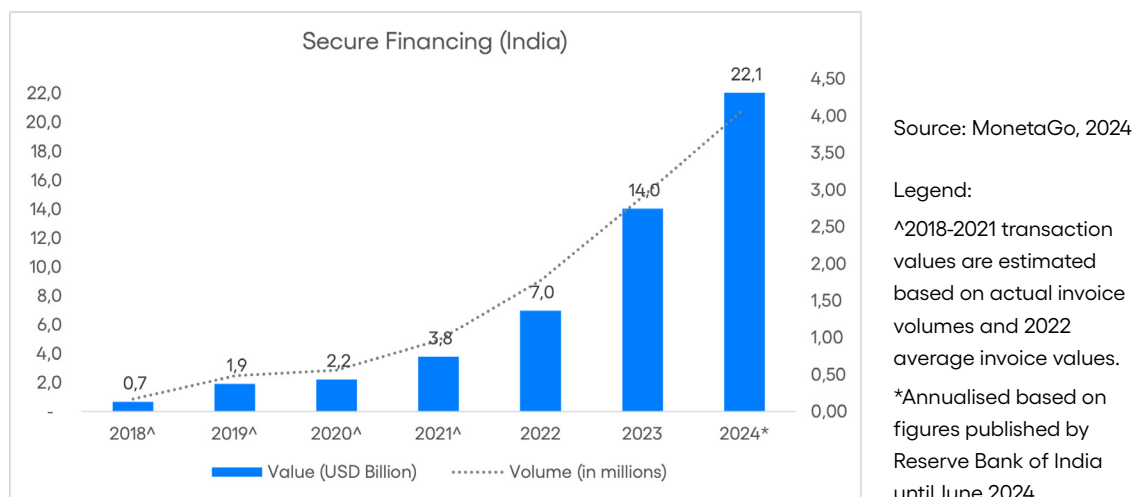
Accelerated transaction time through streamlined data exchange on top of enhanced risk mitigation

Encryption, hashing, and confidential computing solutions have significantly mitigated financing fraud. By facilitating ecosystem-level metadata comparison, MonetaGo has increased transparency and trust in the financing process:

- The improved interoperability drastically reduces costs and streamlines data exchange. Internal data negotiation time has been cut from six months to one week.
- Accurate fraud detection leads to better risk management, allowing financial institutions to extend more credit and confidently enter new markets.

For example, India's TReDS platform has achieved a 78%, as of June, Compound Annual Growth Rate in financing value since 2018. Growing interest from ASEAN, FCI, Afreximbank, and ADB will introduce digitised solutions into new markets, providing SMEs with greater access to financing.

Figure 12: Secure financing transaction value in India during 2018 to 2024



“There is substantial opportunity in the Indian trade and receivables market, and the expanded, global connectivity and capability with MonetaGo’s Secure Financing system will ensure the opportunity is not lost to fraudsters. The trade community has worked hard to reduce risk, and this has allowed greater access to funding by MSME’s, a vital part of the economic ecosystem, and critical to maintaining the ongoing expansion of the trade and receivables market and year-on-year growth.”

Sundeep Mohindru, Promoter and Director, M1Xchange

“The proactive engagement of regulatory authorities in usage of MonetaGo’s interoperable infrastructure will ensure trust among lenders and help promote a thriving invoice finance (e.g. factoring, supply chain finance, asset-based lending) market locally. By mitigating fraud risks whilst preserving confidentiality and privacy, and fostering confidence among lenders, the proposed registry holds the promise of unlocking new avenues of financing for SMEs and fuelling economic growth.”

Neal Harm, Secretary General, FCI



III The journey to digital: Lessons to date and a view on the future

As businesses and public sector agencies across the globe embrace the digital transformation of trade, several key lessons have emerged:

- 1. Digitalisation can start anywhere along the supply chain:**
Digital transformation does not require a single, predefined starting point. Organisations can initiate digitalisation in areas where they can quickly realise value, such as automating manual tasks or enhancing customer-facing processes. Starting with “low-hanging fruits” demonstrates quick benefits, builds momentum, and secures stakeholder support for broader initiatives. For example, automating repetitive tasks not only provides quick returns but also generates critical insights that inform subsequent phases of the digital journey. The flexibility to start where value is most apparent allows organisations to tailor their approach based on existing capabilities and immediate needs.
- 2. Implementation capabilities will likely be drawn from both internal and external sources:** Digitalisation is not a one-size-fits-all process, and often involves a mix of internal and external resources. Organisations can choose from various strategies: deploying off-the-shelf solutions for rapid scalability, developing proprietary systems to address specific challenges, or partnering with technology providers to co-create customised tools. The choice of strategy depends on factors such as the organisation’s size, budget, technical expertise, and strategic goals. A nuanced understanding of available options allows companies to align their digitalisation efforts with their overall objectives, ensuring a more effective and sustainable transformation.
- 3. Leveraging standards is essential for long-term success:**
Standardisation lays the foundation for scalable and sustainable digital ecosystems, especially in complex, multi-stakeholder environments like global trade. Adopting industry standards is crucial for achieving interoperability, reducing friction, and ensuring seamless integration with partners, customers, and regulatory bodies. Organisations that prioritise internationally recognised standards for key trade documents and digital identity are more likely to streamline operations, enhance security, and meet regulatory requirements. In the long run, this approach reduces operational risks and equips organisations to adapt to future changes.
- 4. Success metrics should be tailored to specific needs:**
Success in digitalisation varies based on the unique goals, capabilities, and challenges of each organisation. Companies must establish success metrics that reflect their specific context, whether it is improving delivery times, enhancing customer satisfaction, or accelerating transaction speeds. While initial focus may not always yield immediate economic gains, quantifying benefits helps internal stakeholders understand and support the digital transformation. Tailored metrics ensure that organisations capture the most relevant insights, enabling them to make informed decisions and continuously refine their digital strategies.

5. Initial challenges are outweighed by long-term benefits:

The early stages of digitalisation often present significant challenges, such as increased labour costs due to dual processes and substantial upfront investments in technology and training. However, these challenges are outweighed by the long-term benefits, including operational efficiency, cost savings, and the ability to offer a broader range of services. Organisations that maintain a long-term perspective will find that digitalisation not only streamlines processes but also enhances customer satisfaction and competitive advantage. Over time, these benefits contribute to sustained growth and innovation, making the initial hurdles worthwhile.

6. Benefits can come in unexpected ways:

While efficiency and cost reduction are primary drivers of digitalisation, the journey often yields unexpected benefits that significantly enhance organisational performance. For example, increased employee engagement can result from digital tools that streamline routine tasks, allowing staff to focus on strategic and creative work. Additionally, digitalisation can unlock new opportunities for innovation, enabling companies to respond more quickly to market changes and customer demands. These intangible benefits, though harder to quantify, are just as impactful as the more measurable outcomes, contributing to a more dynamic and resilient organisation.

7. Iterative development and continuous learning will increase the gains over time:

Digital transformation is best approached as an ongoing process rather than a one-time overhaul. Iterative development—starting with small, manageable projects—allows organisations to test ideas, refine processes, and scale successful initiatives. This phased approach reduces risk and fosters a culture of continuous learning and improvement. As organisations adapt to changing market conditions and technological advancements, they can build on their successes, expanding digital capabilities and reaping greater rewards over time.



Turning lessons into action: A checklist for businesses

The seven lessons learned from digitalisation efforts across various industries provide a solid foundation for companies looking to embark on or refine their digital transformation journey.

To help organisations translate these lessons into actionable steps, the following checklist offers seven key actions that businesses should consider:

- 1. Identify areas with visible benefits:** Where in your organisation can digitalisation provide the most immediate and visible improvements?
- 2. Assess digitalisation options:** Have you evaluated whether off-the-shelf, custom-built, or hybrid solutions best align with your needs and strategic goals?
- 3. Start small:** What small, manageable digitalisation projects can you implement to test your approach and build momentum?
- 4. Leverage standards:** Are you incorporating industry standards into your digitalisation efforts from the beginning to ensure long-term success and interoperability?
- 5. Plan for initial challenges:** What potential challenges might you face during the early stages, and how will you address the coexistence of traditional and digital processes?
- 6. Define success metrics:** What specific metrics will you use to measure the success of your digitalisation efforts, considering your unique goals and challenges?
- 7. Anticipate intangible benefits:** How might digitalisation enhance your organisation in unexpected ways, such as employee engagement or new opportunities for innovation?

By addressing these questions, companies can ensure that their digital transformation initiatives are not only aligned with their strategic goals but are also positioned to deliver long-term value across the enterprise.

Self-assessment: How prepared are you for digital trade?

The checklist provided serves as a practical starting point for businesses to navigate the complexities of digitalisation. However, to fully capitalise on the digital transformation, companies need a more comprehensive self-assessment that goes beyond initial inquiries.

The following self-assessment framework is designed to help organisations evaluate their readiness across four critical dimensions of trade digitalisation: availability, accessibility, acceptability, and affordability.

What it means...

Key questions to dive in...

Availability

Does your company have the digital tools, infrastructure, and human resources needed for digital trade?

- Do you have access to essential digital tools like e-invoicing systems and eBL?
- Are your current systems integrated with the necessary technologies?
- Are there sufficient human resources to support your digital adoption?

Accessibility

How easily can your company and supply chain partners access these digital solutions?

- Can your digital systems easily interact with those of partners and clients?
- Are employees trained and proficient in using these digital tools?
- Can your digital solutions be accessed across all geographical locations where you operate?

Acceptability

Are digital solutions accepted and adopted by all affected stakeholders?

- Do all stakeholders (employees, partners, customers) support your digital initiatives?
- How user-friendly are your digital tools?
- Are your digital solutions compliant with both international and local regulations?

Affordability

Is your digitalisation effort cost-effective and sustainable?

- Have you conducted a cost-benefit analysis of your digitalisation efforts?
- Do you have the necessary funding to support and sustain these efforts?
- Can your digital solutions be scaled as your company grows?

By systematically addressing these areas, businesses can take a structured approach to evaluating their digital trade readiness and ensure that their digital transformation efforts are both strategic and sustainable.

Current state of play: Ecosystem and stakeholders' roles in digital trade

In addition to assessing internal readiness, it is vital to understand the broader ecosystem and the roles of various stakeholders in the digital trade landscape. Understanding the positions and challenges of these stakeholders is essential to creating a cohesive and effective digital trade ecosystem:

- **Upstream firms**, such as technology providers and financiers, are increasingly providing the essential resources and technologies necessary for digitalisation. However, they face significant challenges in ensuring that downstream companies are both aware of and able to access their offerings. Market penetration is often limited by the reluctance or lack of capacity among downstream firms to embrace digital solutions, highlighting a critical opportunity in building awareness and scaling education.
- **Downstream corporates**, especially SMEs, stand to benefit immensely from digitalisation. Yet, many of these companies remain unaware of the available resources and technologies that could drive their digital transformation. This information asymmetry is compounded by government inaction, where the absence of favourable policies, legal frameworks, and investment support acts as a significant barrier. Additionally, the costs and strategic shifts required for digitalisation deter many firms, particularly when the benefits are not immediately clear.
- **Multinational corporations (MNCs)** are in a leadership position to drive digitalisation within their supply chains. By setting precedents and adopting digital practices, MNCs can influence smaller firms to follow suit, ensuring compatibility and coherence across the supply chain. However, this influence is not always effectively leveraged, and smaller firms may lag behind, creating disconnects within the supply chain.
- **International organisations, NGOs, and consultancy firms** play a critical role in spreading awareness and providing technical assistance for digitalisation. Their impact, however, depends heavily on effective collaboration with governments and the private sector. Without a unified approach, the efforts of these organisations may be fragmented, limiting their ability to drive widespread digital adoption.
- **Governments** have a pivotal role in facilitating digitalisation through the development of supportive policies, financial incentives, and interoperable frameworks. Enabling policies and investments in public infrastructures, coupled with effective partnership with private sector players and international organisations can significantly accelerate impact.

A view on the future

The lessons learned from digitalisation initiatives on the frontlines highlight the importance of flexibility in starting points, the need for tailored strategies, and the critical role of iterative development and continuous learning. Leveraging industry standards and setting context-specific success metrics are essential for long-term progress. While initial challenges may be daunting, the long-term benefits—including operational efficiency, enhanced competitiveness, and other intangible gains — are significant.

To fully capitalise on digitalisation, businesses must not only focus on their internal readiness but also engage with the broader ecosystem. Upstream firms, downstream corporates, MNCs, international organisations, and governments all have pivotal roles to play in creating a cohesive and effective digital trade environment. For governments, this means continuing to harmonise technical solutions, streamline legal frameworks, and invest in interoperable public infrastructures. By aligning with the private sector and international bodies, the public sector can drive smoother, more efficient cross-border trade, ensuring that digitalisation efforts translate into tangible economic growth and competitiveness.

The path forward requires a unified approach where each actor not only contributes to but also benefits from the collective advancement of the digital trade landscape. With concerted efforts from both the public and private sectors, the full potential of digital trade can be realised, driving growth, competitiveness, and resilience across global markets.



Appendix 1— Acknowledgements

ICC DSI is deeply grateful for the following organisations and teams who generously contributed their insights and lessons which made this collection of case studies possible. Their names are listed in alphabetical order below.



The Australian Centre for International Trade and Investment (ACITI) is an independent not-for-profit, nonpartisan organisation. It is dedicated to advancing Australia’s international economic engagement by facilitating access to information, fostering networks across business, government, academe, and civil society, and undertaking and promoting research and analysis on trade and investment issues of national importance. For more information, please visit: www.aciti.org.au

Contributor: Bryan Clark



African Export-Import Bank (Afreximbank) is a Pan-African multilateral financial institution mandated to finance and promote intra-and extra-African trade. For 30 years, the Bank has been deploying innovative structures to deliver financing solutions that support the transformation of the structure of Africa’s trade, accelerating industrialisation and intra-regional trade, thereby boosting economic expansion in Africa. A stalwart supporter of the African Continental Free Trade Agreement (AfCFTA), Afreximbank has launched a Pan-African Payment and Settlement System (PAPSS) that was adopted by the African Union (AU) as the payment and settlement platform to underpin the implementation of the AfCFTA. For more information, please visit: www.afreximbank.com

Contributors: Haytham Elmaayergi, Annerose Ngemu



Air8, a digital venture of LFX Digital (an affiliate of global supply chain manager Li & Fung), is an award-winning supply chain finance platform that focuses on supporting SMEs. With a heritage of industry experience spanning over a century, Air8 has a deep understanding of the fashion and general merchandise sectors. Air8’s vision is to empower SME exporters in emerging economies by offering accessible financing and industry-specific insights to drive sustainable growth. The Air8 team collaborates closely with suppliers, buyers, and funders within its extensive global network. Since its establishment in 2021, Air8 has provided financing to hundreds of suppliers around the globe, with an annual GMV exceeding \$1 billion. For more information, please visit: www.air8.io

Contributors: Caleb Poon, Erik Kwok, Jerri Zhou, Kowin Chan



ASEAN Single Window is a regional initiative that connects the Single Windows of ASEAN Member States, enabling the exchange of electronic trade-related documents and expediting customs clearance. For more information, please visit: www.asean.org/our-communities/economic-community/asean-single-window

Contributor: Nitas Polachai



BHP is a leading global resources company with approximately 80,000 employees and contractors, primarily in Australia and the Americas. BHP's products are sold worldwide, and it is among the world's top producers of major commodities, including iron ore, copper, nickel, and metallurgical coal. For more information, please visit: www.bhp.com/climate

Contributors: Hui Ling Chan, Joseph Baculi, Heather Liu



Cargo is a SaaS Ocean transportation platform where buyers invite their supply chain stakeholders to collaborate, exchange information and execute orders and shipments. Cargo's broad features and deep functionality cover all parts of the ocean transport supply chain including Procurement, Planning, Execution and Control Tower. For more information, please visit: www.cargo.com

Contributors: Paola Poulenard, Thomas Kofler



CargoX is one of the leading providers of blockchain-based electronic trade document solutions, introducing trust in the digital economy. The CargoX Platform for Blockchain Data Transfer (BDT) is used to create, sign and transfer electronic trade documents, and it facilitated the first blockchain-based electronic bill of lading being used in practice. It is now used by 125,000 businesses and organisations worldwide, who have used it to process more than 7 million documents. CargoX is actively collaborating on developing future standards with major logistics organisations, including DCSA and FIATA. For more information, please visit: www.cargox.io

Contributors: Peter Kern, Igor Dragar



Officially launched by the HKMA in October 2022, Commercial Data Interchange is a consent-based financial data infrastructure that aims to enable more efficient financial intermediation in the banking system and enhance financial inclusion in Hong Kong. It has the potential for solving long-standing pain points in the financial sector, e.g. SME financing, and facilitating innovative usage of commercial data to enhance financial services. For more information, please visit: www.hkma.gov.hk/eng/key-functions/international-financial-centre/fintech/research-and-applications/commercial-data-interchange

Contributors: Chi Wai Chung, Kin Ming Chan, Maggie Leung



DHL Group is the world's leading logistic company. The Group connects people and markets and is an enabler of global trade. It aspires to be the first choice for customers, employees and investors worldwide. To this end, DHL Group is focusing on growth in its profitable core logistics businesses and accelerating the digital transformation in all business divisions. The Group contributes to the world through sustainable business practices, corporate citizenship and environmental activities. By the year 2050, DHL Group aims to achieve net-zero emissions logistics. For more information, please visit: www.dhl.com/discover/en-sg/about-dhl/reports-and-press-releases/mygts-your-gateway-to-easy-international-shipping

Contributors: Bee Cheng Ong, Gavin Conboy, Karthik Sekar, Marcelo Godoy, Mei Sim Yap, Phaik Chen, Theresa Kronmueller, Christoph Baumgarten



The Dubai Trade Single Window is the region's leading single window platform for cross-border trade and logistics solutions. Dubai Trade is spearheading digital transformation with its suite of innovative digital products ranging from cargo handling and customs clearance services to supply chain solutions. As a result, it majorly benefits the trade and logistics industry by improving the ease of doing cross-border trade with the application of advanced digital technology. Offering a diverse range of digital products and services that contribute to trade and logistics efficiencies, its single window platform caters to freight forwarders, hauliers, free zone companies, clearing agents, airline and shipping agents, and beneficial cargo owners. Over 180,000 companies utilise Dubai Trade's end-to-end trade and logistics digital ecosystem. More than 300 million transactions have been conducted since its inception with the platform facilitating nearly 90,000 transactions daily. For more information, please visit: www.dubaitrade.ae.

Contributor: Said Said



Enigio Enigio is a Stockholm-based technology company providing the patented B2B SaaS technology trace:original™. trace:original™ is an interoperable solution for digitised original documents, ensuring consistency, integrity, traceability and possession of digital information. It is used for any type of commercial document required in global trade. For more information, please visit: www.enigio.com

Contributor: Patrik Zekkar



Established by the Financial Stability Board in June 2014, the Global Legal Entity Identifier Foundation (GLEIF) is a not-for-profit organization created to support the implementation and use of the Legal Entity Identifier (LEI) and its digital counterpart the verifiable LEI (vLEI). GLEIF is headquartered in Basel, Switzerland. GLEIF's mission is to manage a network of global partners to provide trusted services and open, reliable data for unique legal entity identification worldwide. GLEIF makes available the technical infrastructure to provide, via an open data license, online access to the full global LEI database free of charge to users. GLEIF is overseen by the Regulatory Oversight Committee, which is made up of representatives of public authorities from across the globe. For more information, please visit: www.gleif.org/en

Contributors: Clare Rowley, Xue Tan, Nuria Vegas, Adrian Ng, Yanzhao Zhang



The Global Shipping Business Network (GSBN) is a neutral, not-for-profit consortium whose mission is to enable paperless, accessible and sustainable growth in global trade with its data infrastructure and ecosystem of partners. GSBN facilitates trusted collaboration between participants across the shipping industry to enable greater efficiencies, and paperless trade as well as supporting the shipping industry's decarbonisation transition. GSBN's ecosystem includes shipping lines, terminals, banks, application developers and other consortia. The entire network accounts for more than half of the containers handled in the world. For more information, please visit: www.gsbn.trade

Contributor: Bertrand Chen



The Hong Kong Monetary Authority (HKMA) is the government authority in Hong Kong responsible for maintaining monetary and banking stability. The HKMA's four key functions are: maintaining currency stability within the framework of the Linked Exchange Rate System; promoting the stability and integrity of the financial system, including the banking system; helping to maintain Hong Kong's status as an international financial centre, including the maintenance and development of Hong Kong's financial infrastructure; and managing the Exchange Fund. For more information, please visit: www.hkma.gov.hk/eng

Contributors: Chi Wai Chung, Kin Ming Chan, Maggie Leung



HSBC Holdings plc, the parent company of HSBC, is headquartered in London. HSBC serves customers worldwide from offices in 60 countries and territories. With assets of US\$2,975bn on 30 June 2024, HSBC is one of the world's largest banking and financial services organisations. For more information, please visit: www.hsbc.com

Contributors: Bhupendra Jagdev, Tze Tze Lee



ICICI Bank Ltd (BSE: ICICIBANK, NSE: ICICIBANK and NYSE:IBN) is a leading private sector bank in India. The Bank's total assets stood at ₹18,92,697 crore at June 30, 2024. For more information, please visit: www.icicibank.com

Kanematsu Corporation, established in 1889, is engaged in trading in various kinds of commercial products, production of traded goods, investment in businesses, provision of related services centered on five segments, ICT Solutions, Electronics & Devices, Foods, Meat & Grain, Steel, Materials & Plant, and Motor Vehicles & Aerospace. For more information, please visit: www.kanematsu.co.jp/en

Contributor: Yasuhide Ikai



Lloyds Bank is proud to support more than one million UK businesses with leading digital and relationship banking services, including as they start up, grow, thrive and trade internationally. Through a network of relationship teams based across the UK, as well as internationally, Lloyds Bank delivers a mix of local understanding and global expertise necessary to provide long-term support to its clients to help them fulfil their growth aspirations. The bank offers a broad range of finance beyond term lending and this spans import and export trade finance, structured and asset finance, securitisation facilities and capital market funding. Its product specialists provide bespoke financial services and solutions, including tailored cash management, international trade, treasury and risk management services. For more information, please visit: www.lloydsbank.com

Contributor: Jon Boran



MonetaGo is a provider of best-in-class fraud detection and prevention solutions. Its Secure Financing systems enables banks, traditional financiers, non-bank financial institutions, fintechs, and trade finance funds to check for duplication and authentication of financing requests linked to invoices, bills of lading, air waybills, warehouse receipts, purchase orders, and other trade-related documents. Since entering full production in 2018, Secure Financing has processed millions of transactions and has been integrated into Swift's API-enabled infrastructure as the first third-party service on Swift, providing its member institutions with an important tool to combat duplicate financing fraud in trade and supply chain finance. Secure Financing is available to all financiers globally via Swift, API, web-based UI and partners. For more information, please visit: www.monetago.com

Contributors: Jialing Chia, Matt Stapleton, Neil Shonhard, Oswald Kuyler



NeXTRADE aims to reduce poverty and make the world a better place by ensuring that MSMEs, SMEs, and emerging economies are included and digitally visible in global supply chains. Through its Global Supply Chain Digital Network, NeXTRADE leverages advanced technologies and international trade facilitation standards to promote inclusive international trade for all. The network provides end-to-end digital transparency and trust at scale, supporting ESG and UNSDG mandates and obligations. For more information, please visit: www.nextradeworld.com

Contributor: Ian Watt



Roanoke Insurance Group Inc. is a specialty insurance broker focused on surety bond and insurance solutions for logistics service providers, customs brokers, and companies managing supply chains. Founded in 1935, Roanoke was the first provider of customs import bonds and the first appointed ATA Carnet provider in the United States. Roanoke has decades of partnership with the trade community as a trusted provider of insurance, surety bonds, ATA Carnet products, and specialty services. For more information, please visit:

www.roanokegroup.com

Contributors: Colleen Clarke, Jennifer Rome, Matt Zehner



SUCAFINA is one of the leading coffee trade houses in the world. Founded in 1977 in the city of Geneva, Switzerland, it's entirely focused on coffee and remains a family company with a strong entrepreneurial culture and an eye for value. With the purpose of creating opportunities to improve lives, Sucafina's vision is to be the leading sustainable Farm to Roaster company in the world. This vision and purpose are being achieved through Adaptability, Entrepreneurship, Expertise, Humility, Integrity and Passion which make up the core values of Sucafina. For more information, please visit: www.sucafina.com/apac

Contributors: Mohamad Alaiti, Raphaele Hemmerlin



Swift is a global member-owned cooperative and the world's leading provider of secure financial messaging services. We provide our community with a platform for messaging, standards for communicating and we offer products and services to facilitate access and integration; identification, analysis and regulatory compliance. Our messaging platform, products and services connect more than 11,000 banking and securities organisations, market infrastructures and corporate customers in more than 200 countries and territories. Whilst Swift does not hold funds or manage accounts on behalf of customers, we enable our global community of users to communicate securely, exchanging standardised financial messages in a reliable way, thereby facilitating global and local financial flows, and supporting trade and commerce all around the world.

Contributors: Gokhale Avanee, Valdezate Morejon Esther, Duval Xavier, Tan Yanfang



Founded by Jamsetji Nusserwanji Tata in 1868 and headquartered in India, the Tata group is a global business conglomerate, operating in over 100 countries across 6 continents. From an early foray into steel and automobiles to staying abreast of the latest technologies, the Tata group today has a strong presence across diverse industries, such as agrochemicals, automotive, chemicals, construction, finance, consumer products, and hospitality.

Contributors: Sanjay Sahni, Sarajit Jha, Sudeep Banerjee



TradeGo Pte. Ltd., headquartered in Singapore, is dedicated to building the digital service platform “TradeGo” for international commodity trade. With a blockchain architecture as its foundation, the platform addresses the authenticity and efficiency issues in international trade, providing efficient and reliable transaction services for the industry stakeholders along the supply chain. Through the platform, we provide three main solutions for paperless trade, digital bunkering and electronic signature of contract, which are respectively TradeDocs (IGP&I approved), BunkerGo (MPA whitelisted) and TradeSign. For more information, please visit: www.tradego.com

Contributors: Bing Li, Min Liu, Yinzhi Geng, Yingjiao Yu, Wuyu Zhao



TradeWaltz Inc. provides and operates TradeWaltz, a SaaS platform for cross-industry trade information collaboration. Powered by blockchain technology, TradeWaltz enables secure, integrated management of trade transaction data, resulting in a 44% to 60% improvement in business efficiency. With an ambition to connect with overseas platforms, we aim to establish TradeWaltz as a key B2B information hub in Asia. For more information, please visit: www.tradewaltz.com/en

Contributor: Munetoshi Yamada



Vale is a global mining company that exists to improve life and transform the future together. One of the world’s leading producers of iron ore and nickel and a major copper producer, Vale is headquartered in Brazil and operates around the world. Its operations comprise integrated logistics systems, including approximately 2,000 kilometers of railways, marine terminals and 10 ports distributed around the globe. Vale has the ambition to be recognised by society as a benchmark in safety, the best-in-class reliable operator, a talent-driven organisation, a leader in sustainable mining, and a reference in creating and sharing value. For more information, please visit: www.vale.com

Contributor: Bruno Sales



WaveBL is the leading platform for digitizing electronic trade documents, offering a blockchain based innovative solution for the global trade industry. Focusing on accuracy, security, and interoperability, WaveBL is transforming the way the supply chain handles trade documentation. For more information, please visit: www.wavebl.com

Contributor: Boaz Lessem Adv.



XDC Trade Network uses innovative technologies to enable cross-border trade document movement more efficiently with increased transparency and provide for trade finance. Our digital solution helps the trade participants to create any trade document meeting the requirements of MLETR with data standards as prescribed by ICC DSI. These digital trade documents are shared, endorsed, verified, and even title transferred for raising trade finance at a reduced cost. For more information, please visit: www.xdctrade.network

Contributors: Lingraj Mahanand, Sunil Senapati



The International Chamber of Commerce (ICC) is the institutional representative of more than 45 million companies in over 170 countries. ICC's core mission is to make business work for everyone, every day, everywhere. Through a unique mix of advocacy, solutions and standard setting, we promote international trade, responsible business conduct and a global approach to regulation, in addition to providing market-leading dispute resolution services. Our members include many of the world's leading companies, SMEs, business associations and local chambers of commerce.



The ICC Digital Standards Initiative (DSI) aims to accelerate the development of a globally harmonised, digitised trade environment, as a key enabler of dynamic, sustainable, inclusive growth. We engage the public sector to progress regulatory and institutional reform, and mobilise the private sector on adoption, implementation and capacity building.