

Connecting global trade

Enabling interoperability between financial institutions and electronic Bill of Lading (eBL) platforms



**Proof of Concept
Results report**
December 2023

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1. Executive summary

With a long history of enabling interoperability between financial institutions, Swift is uniquely positioned to support eBL interoperability.

Electronic Bills of Lading (eBL) can help drive trade digitisation

From reducing costs and improving efficiency to addressing the [\\$2.5 trillion trade finance gap](#), there are many reasons to digitise global trade. And one of the ways that this can be achieved is by embracing an electronic alternative to traditional paper Bills of Lading.

Used in international trade and shipping, Bills of Lading have long been associated with manual processes, inefficiencies and the risk of document loss and fraud. Transferring physical documents can take weeks, and paper-based processes also come with a significant carbon footprint. The adoption of Electronic Bills of Lading (eBL), which can be stored on digital platforms and shared between industry players on a real-time basis, could help to address these challenges and move trade digitisation forward.

Efforts are underway to increase the adoption of eBL

[Research by McKinsey has found](#) that using eBL could save \$6.5 billion in direct costs annually, and enable \$40 billion in global trade. However, adoption has so far been slow, and in 2022, only 2.1% of the Bills of Lading and waybills used in the container trade were electronic, [according to the FIT Alliance](#).

Yet, there is much room for optimism. A number of initiatives are currently ongoing aimed at increasing eBL adoption, including a commitment by DCSA member carriers to achieve 100% eBL usage by 2030, and the FIT Alliance's recent '[Declaration of the electronic Bill of Lading](#)'. Also significant was the [UK's Electronic Trade Documents Act \(ETDA\) 2023](#), which came into effect in September 2023.

Interoperability is needed between different eBL platforms

An important barrier to adoption is the lack of technical interoperability between different eBL platforms. The nine eBL providers currently licenced to operate each have their own customer bases, rule books, and identity and connectivity frameworks – so customers of different eBL systems cannot exchange eBL with each other unless they sign up to multiple platforms.

There is a clear need for eBL platforms to interoperate, so that users of different platforms could interact with each other using a single identity. This could also help to speed up the exchange of documents, while reducing costs, improving transparency and mitigating the risk of fraud.

We've developed an eBL interoperability model

With a long history of enabling interoperability between financial institutions, Swift is uniquely positioned to support eBL interoperability. In June 2022, we began working with our FIT Alliance partners and eBL platform providers to develop an interoperability model. The resulting solution includes an API layer which connects ecosystem partners, using Swift as a central connector. Using this model, each platform can integrate once with Swift, instead of requiring point-to-point integration with every other platform.

Then in 2023, we ran a Proof of Concept to develop and test the technical solution using Swift's API sandbox environment. This project included two phases:

Phase 1: eBL platforms edoxOnline and CargoX implemented a single ubiquitous API contract, which provides an immutable record of ownership in the endorsement chain.

Phase 2: We expanded the participant group to include four eBL platform providers – CargoX, edoxOnline, TradeGo and WaveBL – as well as BNY Mellon and Deutsche Bank. APIs were used to transfer documents between participants and reproduce the end-to-end flow transfer process of an eBL.

By establishing the technological foundation for interoperability, our solution has the potential to reduce costs and improve efficiency.

The PoC demonstrated that the solution could support interoperability

Participants reported that the solution could allow eBL platforms to interact with each other, and that banks were able to use their existing Swift connectivity to exchange eBL across multiple platforms.

The key findings of the PoC were that the solution could:

- Increase interoperability between digital repositories and ecosystem partners.
- Help participants meet security and compliance standards.
- Help participants respond to the technology shift and meet customer expectations.
- Support faster, easier and standardised connectivity.
- Ease adoption for all firms involved by using a standardised API.

By establishing the technological foundation for interoperability, our solution has the potential to reduce costs and improve efficiency. It could also empower the community with a standardised API solution, support front-end innovation, and enable participants to expand their reach to additional communities.

Swift will continue to engage with its members and industry experts

Building on the success of the PoC, we will continue to engage with our members and with industry experts. The first step will be to gauge interest in the proposal, and develop a collaborative industry plan.

Questions will still, however, need to be addressed on the subject of legal interoperability: while some countries, such as the UK, now allow a Bill of Lading to exist in electronic form with rights that are recognised in court, this is not the case elsewhere.

It is clear that banks, platforms and corporates have a strong appetite from for 'going digital' – and as such, we believe the PoC could lead to a broader solution for promoting trade digitisation.

2. Business context

Industry efforts to digitise trade are continuing to gain momentum – and for good reason. Trade digitisation has the potential to reduce costs, increase efficiency, improve transparency and reduce compliance times in international trade.

Digitisation could help to mitigate fraud, support inclusivity and sustainability, and address the [\\$2.5 trillion trade finance gap identified by the Asian Development Bank](#). And, with more than half of cross-border payments made over Swift linked to global trade, driving automation in trade will remove friction from transactions end-to-end, and ultimately speed up the underlying payments.

One key area of focus is the Bill of Lading, an important legal document used in international trade and shipping. Issued by the carrier to the shipper, the Bill of Lading performs three key functions: it acts as a document of title, a receipt for goods, and evidence of the contract of carriage.

Bills of Lading have long depended on manually intensive and operationally inefficient paper-based solutions, resulting in inefficient supply chain processes. However, this is now changing as the broader shipping and financial services communities move to embrace a secure, reliable and trusted digital solution.

Electronic Bills of Lading (eBL)

Electronic Bills of Lading – the electronic equivalent of traditional paper-based Bills of Lading – have an important role to play in the drive for trade digitisation. By creating and storing eBL on digital platforms, key participants in trade transactions can share eBL securely on a real-time basis.

Widespread adoption of eBL could help the industry reduce costs, increase the efficiency and reliability of international trade, and mitigate the risk of fraud, as well as reducing the environmental impact of paper-based documents. Indeed, [research by McKinsey](#) indicates that eBL adoption could lead to cost savings of \$6.5 billion a year for all stakeholders, and unlock a further \$40 billion in global trade growth by 2030.

Expanding eBL adoption: A key industry challenge

While the benefits of using eBL for all players in the supply chain process are generally recognised, there is still some way to go before widespread adoption is achieved. Indeed, [according to the FIT Alliance](#), in 2022 only 2.1% of the Bills of Lading and waybills used in the container trade were electronic, and, in reality, the extent to which even those Bills of Lading were electronic for their entire lifecycle is debatable.

Nevertheless, in the last year, a number of initiatives have focused on increasing the adoption of eBL across the industry. Notable developments include:

- **100% eBL usage by 2030.** In February 2023, DCSA announced that the CEOs of all DCSA member carriers have [signed a commitment to the industry](#) to issue 50% of their Bills of Lading digitally within five years, and 100% by 2030.
- **25 by 25 pledge.** In March 2023, the Baltic and International Maritime Council (BIMCO) launched its [‘25 by 25 pledge’](#), whereby some of the largest shippers in the bulk sector committed to moving 25% of their annual seaborne trade volume using eBL for at least one commodity by 2025.
- **Declaration of the electronic Bill of Lading.** In September 2023, the FIT Alliance – which includes BIMCO, DCSA, International Federation of Freight Forwarders Associations (FIATA), International Chamber of Commerce (ICC), and Swift – launched the [‘Declaration of the electronic Bill of Lading’](#). The declaration aims to secure commitment from the relevant stakeholders to drive digitalisation within their industries.
- **Electronic Trade Documents Act.** The [UK’s Electronic Trade Documents Act \(ETDA\)](#) came into effect on 20 September 2023. [According to international law firm, Clifford Chance](#), the ETDA should be viewed as a step forward as a significant proportion of global trade is conducted using English law documents, and it is hoped that other jurisdictions will follow.

“Achieving widespread adoption of a standards-based eBL will benefit not only the shipping industry, but also the global movement of goods, at a time when supply chain resilience is challenged.”

The FIT Alliance

Benefits of eBL

1. Reduced risk of document loss, forgery or fraud.
2. Documents are transferred in moments instead of weeks.
3. Paperless processes result in a smaller carbon footprint.
4. Accessible from any device and available 24/7.
5. Lower courier fees, reduced workload and zero paperwork.

Source: [How to Navigate the Transition from Paper Bill of Lading \(BL\) to eBL](#), MSC Mediterranean Shipping Company.

There is a critical need for a better solution – one that achieves technical interoperability between the existing eBL platforms.

The importance of eBL interoperability

Despite this clear industry appetite for adopting eBL, a key barrier to adoption is the lack of interoperability between different eBL solutions. At present, nine eBL solution providers are authorised by the International Group of Protection & Indemnity Clubs (IGP&I) – however, each of these operates independently with its own customer base and contractual rule book – and each has its own proprietary identity, connectivity and security frameworks.

As such, customers of one eBL system cannot do business with customers of another eBL system. Corporates and financial institutions therefore need to sign up and connect to multiple eBL systems in

order to exchange eBL, resulting in unnecessary costs, delays and inefficiencies. Based on the feedback Swift has received from its community, the continued use of individual ‘digital island’ platforms is not sustainable for financial institutions.

There is a critical need for a better solution – one that achieves technical interoperability between the existing eBL platforms. Users of different platforms would then be able to interact with each other using a single identity, thereby speeding up document exchange, reducing costs and increasing security in trade transactions. Ultimately this could help to improve transparency in international trade.

eBL interoperability: The key drivers

The industry-wide focus on achieving eBL interoperability is being driven by a number of business objectives and technical considerations:

Business

To support global interoperability of eBL

To reduce the time and cost associated with document exchange

To improve the traceability and accuracy of data

To prevent document loss, forgery or fraud

To reduce carbon footprint and support ESG

To achieve the industry target of 100% eBL usage by 2030

Technical

To streamline and standardise connectivity

To eliminate the need for multiple point-to-point connections

To meet regulatory requirements with a secure and trusted network

To integrate rapidly with new participants

To support value added services with a composable platform

To harness APIs and cloud-native technology

“While the aggregate number of customers of all the eBL systems is significant, they cannot currently do business with each other unless they all sign up to the same eBL system.”

**Robert Parson,
Partner,
Squire Patton Boggs
(UK) LLP**

eBL interoperability: The legal perspective

The trade industry is moving in the right direction, as illustrated by the recent adoption of the [Electronic Trade Documents Act \(ETDA\)](#) in the UK. We spoke to Robert Parson, Partner at Squire Patton Boggs (UK) LLP, and international trade law expert, to understand why this is such an important development.

What is an eBL in legal terms?

An eBL is a contractual instrument that allows parties to a private agreement to treat that structure as if it were a real paper bill of lading but in electronic form. A few countries, such as the UK, have enacted legislation that allows a Bill of Lading to exist in electronic form. Elsewhere, however, a contractual shipping document that exists only in electronic form cannot legally be a valid Bill of Lading that is recognised in court.

Why is interoperability so important?

The problem with any right that only exists under a private contract, rather than being available under the general law, is that only parties to the contract can enjoy the rights. As such, the customers of one eBL system cannot get involved in transactions being dealt with under another eBL system. Unless all the different eBL systems were to merge into one system, the only way for customers of different eBL systems to interact is for the respective eBL systems to agree contractually to permit that interaction. That interaction is what we call ‘interoperability’.

Why does English law matter in the context of global trade?

Due to the UK’s legacy in world trade, English law has become the market standard in shipping and maritime with a well-established and reputable jurisprudence.

How does English law support interoperability?

Under English law, if all the different eBL systems (and their members/customers) agree that an eBL created in one eBL system is to have legal effect in another eBL system, then English courts will enforce that agreement. The interoperability agreement has to achieve three core objectives:

1. It needs to bind all the parties in the different eBL systems.
2. It must express that the eBL rights created in each eBL system are transferred to and enforceable in the other eBL systems by parties in those other eBL systems. English law will allow parties to agree anything which is not contrary to public policy.
3. It has to express how the eBL will move between different eBL systems technically.

As with any major agreement it will allocate risk and explain how disputes will be dealt with should they occur, as well as dealing with other ‘boilerplate’ provisions that protect the different parties’ rights.

3. Enabling eBL interoperability

Swift is uniquely well positioned to help address the eBL interoperability challenge.

Swift has enabled global interoperability between financial institutions for 50 years. We are continually collaborating with players from across the financial ecosystem and beyond to enable our members to interact with new platforms and players using a single identity and connectivity model.

For instance, we're currently completing a second round of sandbox testing of our solution for [interlinking central bank digital currencies \(CBDCs\)](#), as well as experimenting to [see how our members could use their Swift connection to seamlessly interoperate with the multitude of blockchain networks emerging around the world](#).

As such, Swift is uniquely well positioned to help address the eBL interoperability challenge.

Trusted, secure and standardised API connectivity

As they have done in other industries, APIs have the potential to transform global trade and are already playing an important role in enabling and accelerating digital transformation. By constantly connecting and exchanging data between applications and web servers, APIs can enable all players in a given transaction to receive all the information they need in real-time, on demand.

Swift has been a leader in unlocking the power of APIs for its community. Usage of our API channel has grown considerably since its launch, with a total of 1.3 billion API calls made over Swift in 2022.

Our users can now access a wide selection of products and services via APIs – offered by Swift, our members and third-party providers.

We think that Swift's single identity and connectivity API model can efficiently solve the eBL interoperability challenge. Financial institutions could reuse their connection to Swift to communicate with all eBL platforms using a standardised API, without having to develop a secure channel to each platform individually – thereby avoiding the associated complexities and costs.

Developing an eBL interoperability model

So, in June 2022, Swift began working with its FIT Alliance partners and eBL platform providers to develop an interoperability model that would allow any party to transact by signing up to just one eBL provider. Using this model, data can be sent between eBL platforms and Swift using an API, enabling different players to exchange documents without having to sign up to the same platform (see Figure 1).

At the centre of this architecture is an API layer, which connects all ecosystem partners using Swift as a central connector. The API layer offers a set of standardised functionalities to enable different systems to interoperate.

Figure 1: The key elements in Swift's eBL interoperability model



Creating a network effect

The resulting interoperability solution interlinks eBL repository platforms by facilitating communication between distributed ledger technology (DLT)-based and non-DLT-based repositories. As illustrated in Figure 2 below, each platform needs to integrate only with Swift, rather than integrating with every other individual platform to provide global reach.

The advantage of this model is that it can scale to support many participating platforms without increasing the complexity of point-to-point integration – thereby creating a network effect and providing reach to all connected Swift members.

It was also critical to ensure that the model could integrate seamlessly into complex trade transactions. Figure 3 below provides an overview of how the API connectivity offered by Swift can enable the flow of the eBL documentation between all players involved in the supply chain process.

Swift’s centralised model also means that all parties in the transaction can benefit from certainty of delivery, enhanced end-to-end visibility and transparency.

Figure 2: Point-to-point vs hub and spoke integration

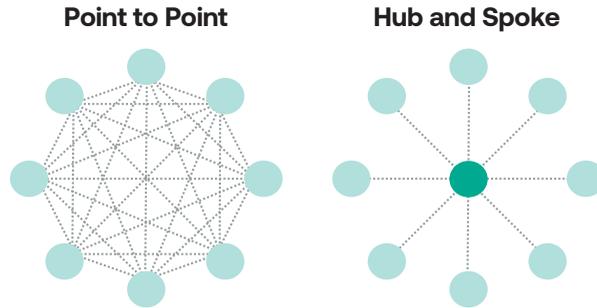
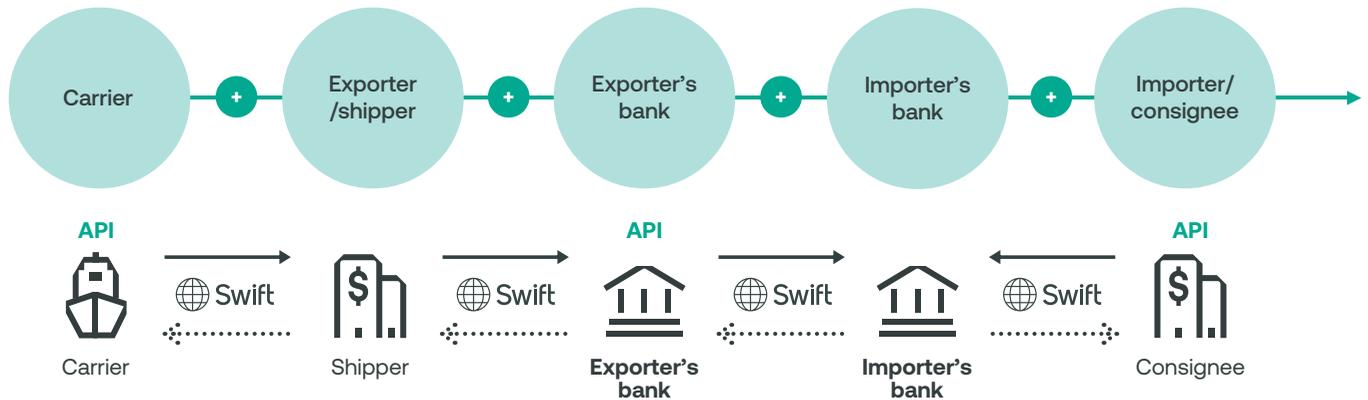


Figure 3: Interoperability between all players in the supply chain



4. The Proof of Concept

Once we had developed a model for eBL interoperability, the next step was to develop and test the technical solution, using an Electronic Transport Document API based on the DCSA's industry specifications.

This resulted in a Proof of Concept (PoC) that aimed at achieving seamless integration and adoption, thereby eliminating the need for peer-to-peer integration between different participants.

The PoC required the development of an API layer to support the transfer of eBL using a single identity and connectivity. In order to meet high security and legal compliance standards, the API layer needed to be able to connect trade repositories and ecosystems, thereby creating the technological foundation for interoperability.

Once the technical infrastructure was in place, the PoC tested the capability of the connector solution to facilitate the communication between multiple eBL repository platforms – whether they are based on DLT, or traditional technologies.

Phase two

The next step was to run another round of testing with a larger group of participants, including banks as well as additional eBL platforms. Building on the first phase, Swift brought together four eBL platform providers – CargoX, edoxOnline, TradeGo, WaveBL – and two financial institutions: BNY Mellon and Deutsche Bank.

A key objective was to demonstrate that the platforms that had taken part in the first phase could reuse the same connectivity to connect to more participants without an increase in costs.

At this point, the design and functionalities of the APIs were tested and validated by transferring documents between trade repositories and banks.

The participants reproduced the end-to-end flow transfer process of the eBL. This involved the following steps:

1. edoxOnline or WaveBL creates the eBL in the Swift sandbox environment.
2. edoxOnline or WaveBL issues the eBL to CargoX.
3. CargoX transfers the eBL to BNY Mellon.
4. BNY Mellon transfers the eBL to Deutsche Bank.
5. Deutsche Bank transfers the eBL to TradeGo.

The PoC objectives



To connect trade repositories and ecosystems.



To eliminate the need for peer-to-peer integration.



To set the technological foundation for interoperability.



To increase efficiency, reduce costs, and potentially eliminate the risk of fraud.

How the PoC worked

This PoC was executed over a period of three months in 2023 using Swift's API sandbox environment, and was split into two separate phases.

Phase one

In the first phase, two authorised eBL platforms, edoxOnline and CargoX, took part in a series of trials to demonstrate the potential of the solution to establish technical interoperability via the Swift platform.

The platform providers implemented a single ubiquitous API contract, exposed over the Swift platform, to set the path for digital transformation and industry-wide adoption. The API contract was designed to provide an immutable and auditable record of ownership in the endorsement chain, reducing the risk of fraud and improving compliance. These first trials successfully demonstrated how the two platforms could securely interact with Swift.

“There is clear potential for banks to reuse their Swift infrastructure to reduce the time, and most importantly the costs, associated with document exchange.”

Joon Kim, Global Head of Trade Finance, BNY Mellon

Key findings

The feedback from participants was that participating in the PoC had proved that the solution could allow eBL platforms to interact with each other. The model also demonstrates that banks could use their Swift connectivity on-premise – or a Software-as-a-Service (SaaS) solution provided by the eBL repositories – to facilitate the exchange of eBL across multiple trade platforms, without having to directly connect to each one individually.

The core findings of the PoC were as follows:

- **The solution could increase interoperability between digital repositories and ecosystem partners.** The PoC validated that interoperability could be achieved in a secure way with the transfer of eBL. The challenge of point-to-point connectivity increases rapidly as more platforms are included: connecting two platforms may only involve one connection, but linking five platforms involves 10 separate connections. Using Swift’s solution, in contrast, each platform only needs to connect once to access all the other platforms.
- **The solution could help participants meet security and compliance standards.** Banks need to meet high security, legal and compliance standards where connectivity is concerned. The PoC demonstrated that by using the interoperability solution, banks can leverage Swift’s core strengths of identity, security and non-repudiation while connecting to eBL platforms.
- **The solution could help participants respond to the technology shift and meet customer expectations.** Customers are increasingly demanding an integrated experience. The PoC has shown that the interoperability solution allows customers to connect with their partner of choice, meaning that they can use different platforms in different contexts or locations.

- **The solution could support faster, easier and standardised connectivity.** The potential for operational cost saving is significant, as the solution is able to overcome the challenges firms face when developing custom point-to-point integrations with multiple, fragile and complex dependencies. Ultimately this could reduce the cost of trade for financial institutions and end customers alike.
- **The solution could ease adoption by all firms involved, by using a standardised API.** The API provides a standardised consumption model without any proprietary software component. The PoC confirmed that the interoperability solution can significantly reduce costs by providing a single access layer, and demonstrated that APIs offer a low barrier for entry that can support greater inclusivity and frictionless adoption.

By establishing the technological foundation for interoperability – in other words, enabling participants to transition from the traditional paper-based Bill of Lading to an eBL, and providing a data-rich solution – the PoC demonstrated that Swift’s solution can support increased efficiency, reduce costs, and potentially reduce the risk of fraud.

Further, the solution could empower the community with a standardised API that enables continuous innovation at the front end. The interoperability layer could also enable trade platforms, banks, applications and registries to expand their reach to the communities of all other participating registries and platforms.

The result could be a global interoperability framework that addresses both legal and technical considerations – thereby enabling trade documents to be exchanged digitally across more than 200 countries and territories.

5. Conclusion and next steps

“This work to standardise and automate the eBL transfer process will help deliver a significantly more efficient, reliable and secure supply chain process in the future.”

Michael Fenyk, Senior Product Manager, Deutsche Bank

This PoC set out to validate the feasibility of exchanging eBL across a restricted group of trade platforms and banks, and thereby increase interoperability and visibility in the supply chain.

This work clearly established the benefits of using a single identity, single connectivity model, compared to a peer-to-peer model which is expensive and difficult to scale. It successfully demonstrated how APIs could be used to achieve interoperability between ecosystem players and help the adoption of eBL, while supporting their functionality.

The API provides a low footprint and cost-effective connectivity model, which reduces administrative and operational expenses. As such, there is an opportunity to embed the eBL platform capability using Swift’s footprint and industry security standards. This, in turn, would bring improvements in the form of greater efficiency, security and transparency.

Next steps

The PoC has demonstrated that Swift’s platform can be leveraged to achieve eBL interoperability using its existing core infrastructure. Swift will build on this success by engaging further with its members and with key industry experts to explore developing a solution that could be brought to market.

In the first instance, Swift will work with banks, eBL repository platforms and industry bodies to determine interest in the proposal, and will develop a collaborative industry plan that could support widespread adoption. Alongside any incremental technology and standards developments, this consultation will also address the areas of accessibility and engagement.

A number of platforms – including eBL platforms as well as other platforms that support the broader digital trade journey – have indicated an interest in joining Swift in this initiative. With growing interest from banks for an eBL solution with a low cost of entry, we believe there is optimism for the successful development of productised solution.

Supporting the interoperability agenda

To be clear, Swift is not planning to develop its own eBL platform. Instead our interoperability solution is intended to help current and future players operate and excel in this space. To support this goal, Swift will simply do what it does best: connect people, connect the industry, and connect transactions.

Moving forward, the question of legal interoperability will need to be addressed. Legal interoperability is needed to accommodate all relevant parties and align with the broader evolving legal and regulatory changes currently being adopted around the world, such as the UK’s ETDA. In the meantime, as the industry embraces the journey to zero paper in trade, Swift’s proposed solution provides an avenue to further the broader interoperability agenda.

Banks, platforms and corporates are all interested in ‘going digital’, as highlighted by the growing number of organisations which are signing up to the FIT Alliance’s eBL Declaration. As of December 2023, around 90 institutions had already signed the declaration, including financial institutions, freight forwarders, ocean carriers, ports, terminals, shippers and solution providers. This positive momentum, and the conversations we are having with clients on the importance of going digital, demonstrate the need to pursue options such as Swift’s eBL connector solution.

We believe that this eBL PoC could lead to a broader solution, to promote document digitisation and the exchange of all digital title documents in trade. As such, we stand ready to work with our community to help pave the way to achieve the vision of ‘zero-paper trade’.

Want to learn more?

If you would like to provide feedback or learn more about our eBL interoperability solution, please get in touch with your Swift account manager or contact innovate@swift.com.

6. Acknowledgements

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About Swift

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 financial crime 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, enabling them to communicate securely and exchange standardised financial messages in a reliable way.

As their trusted provider, we facilitate global and local financial flows, support trade and commerce all around the world; we relentlessly pursue operational excellence and continually seek ways to lower costs, reduce risks and eliminate operational inefficiencies. Headquartered in Belgium, Swift's international governance and oversight reinforces the neutral, global character of its cooperative structure. Swift's global office network ensures an active presence in all the major financial centres.

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