

The dynamics around the digitisation of documents

– The eBL as vehicle towards a more data-driven approach

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Abstract

Digitisation comes down to representing information that we have traditionally put on paper by zeroes and ones in a digital file. Current examples of document digitisation in the maritime domain are Bills of Lading (BL), Statements of Fact, and diverse certificates. The purpose of digitisation is to improve synchronisation and communication between parties involved, automate processing, and support fact-based decision-making. Processes are empowered by standardisation and protected by security measures – since digitised information is both more vulnerable and easier to access than paper. There are data harvesting opportunities resulting from redefining and digitising traditional processes allowing us to reach a higher degree of synchronisation and resilience through better preparedness for forthcoming events along the supply chain. In this article we elaborate generically on the role of electronic documents using the eBill of Lading (eBL) as a real-life example that illustrates the opportunities and challenges that arise from the digitisation of documents.

Introduction – What electronic documents have to offer

Estimates suggest that the full implementation of the Framework Agreement on Facilitation of Cross-Border Paperless Trade in Asia and the Pacific adopted in 2016 could boost Asia Pacific exports by as much as \$257 billion annually, while the time required to export could fall by 44%, according to the United Nations Economic Commission for Europe (UNECE). The impact of digitalisation initiatives can also be seen in places like Senegal, where the electronic single window reduced border preclearance and clearance processing time by 90%, from an average of two weeks to just one day.¹

Managers operating in the maritime industry are overloaded with bureaucracy and bringing forward different kinds of documentation. Just to make a port call demands that a captain must file a pile of various documents,² many of them covering the same information but formatted in different ways. In international trade, customs processes require substantial administrative effort extending the time to get goods released. Some years ago, IBM and Maersk followed a test shipment of flowers from Kenya to the port of Rotterdam, which resulted in a stack of nearly 200 communications documents. The costs associated with such processing and administration of trade documents were estimated at that time to be up to one-fifth of the physical transportation costs.

Building on the long history of development within the maritime sector and the characteristics of the maritime supply chain as a self-organised system,³ the introduction of electronic documents provides a lot of potential benefits to achieve a connected maritime ecosystem and enable digitalisation across

¹ World Economic Forum and the UNECE (2017) Paperless Trading: How Does It Impact the Trade System?, White Paper (http://www3.weforum.org/docs/WEF_36073_Paperless_Trading_How_Does_It_Impact_the_Trade_System.pdf)

² <http://www.maritimeknowhow.com/home/harbour-formalities/formalities-on-arrival>

³ Watson R. T., Lind M., Delmeire N., Liesa F. (2020), Shipping: A Self-Organising Ecosystem, in M. Lind, M. Michaelides, R. Ward, R. T. Watson (Ed.), Maritime informatics. Heidelberg: Springer (<https://maritimeinformatics.org/2020/10/maritime-informatics/>)

value networks. Through the ease of use of electronic documents and their speed of processing the various stakeholders along the chains can achieve significant gains in time and reduce costs.

We have seen that there are initiatives already being taken; for example, collaborations emerging between customs agencies allowing importing customs organisations to be well-informed and prepared before goods reach the port of destination and thereby increasing their throughput. All this is thanks to digital information which travels much faster than the physical pieces of paper that otherwise accompany the goods. The process of turning physical documents into digital information and realising efficiency gains and process improvements arising from such transformation is a core aspect of [Maritime Informatics](#).⁴

Important developments in transport document digitisation

The aviation sector provides an example that shows the positive impact of electronic documents, in particular through the digitisation of the digital contract between the “forwarder” and the “carrier” (airline), the so-called electronic Air WayBill (eAWB). Since its introduction in 2010, the eAWB has now become the default contract for all air cargo shipments on enabled trade lanes and most other air transport documents have also been digitalised. “This key industry milestone has brought air cargo into a new era where digital processes are now the norm and paper is the exception”.⁵ The International Air Transport Association (IATA) claims that the transformation of the paper contract into the eAWB has brought numerous benefits, such as improved efficiency and reliability of the overall cargo handling process, faster delivery times, decreased handling errors and positive impact on the environment with reduced paper usage through the elimination of paper-based processes.

More recently, electronic documents have entered in the maritime industry too. In 2021, MSC⁶ and then both Hapag-Lloyd⁷ and ONE⁸ launched with technology provider WAVE BL their approaches to the eBill of Lading (eBL) providing opportunities for the involved parties across the networks to become much more connected. Beyond the Bill of Lading there are also initiatives being taken to digitalise paper-based certificates of ships (ship documentation) and crews (seafarers service book).⁹ In this article we look at the benefits and barriers for digitising documents - introducing electronic documentation, paying specific attention to the introduction of the eBL.

The introduction of the eBL: carriers’ expectations and challenges

In the light of recent advancements in making the eBL the default contract for maritime transport we consider it timely to reflect upon the drivers and barriers related to its introduction and analyse the learnings from the pioneers. The goal of such an analysis is our desire to accelerate the adoption going forward.

One important building bloc to encourage the implementation of electronic documents is proof of concept (POC) projects conducted between carriers and multiple platforms and customers. Other

⁴ Lind M., Watson R., Hoffmann J., Ward R., Michaelides M. (2020) Maritime Informatics: an emerging discipline for a digitally connected efficient, sustainable and resilient industry, Article No. 59 [UNCTAD Transport and Trade Facilitation Newsletter N°87 - Third Quarter 2020] (<https://unctad.org/en/pages/newsdetails.aspx?OriginalVersionID=2456>)

⁵ <https://www.iata.org/en/programs/cargo/e/eawb/>

⁶ <https://www.msc.com/chn/press/press-releases/2021-april/msc-introduces-new-electronic-bill-of-lading>

⁷ <https://www.hapag-lloyd.com/en/company/press/releases/2021/09/hapag-lloyd-introduces-worldwide-electronic-bills-of-lading.html>

⁸ <https://www.one-line.com/en/news/one-taps-wave-bl-advance-eb-operations-and-scale-global-collaboration-digital-trade>

⁹ Lindved M. (2019) Paperwork operation in the maritime industry, master thesis, Aalborg University Copenhagen

factors that assist adoption are actions that leverage existing networks and that help to promote the solution widely.

Technological progress does not come without risks. Concerns such as ... *“if the electronic bill system is not secured, it can be hacked, and the details can be manipulated as per the convenience of the hacker, leading to fraud and loss of cargo”*¹⁰ have been raised. But this can be addressed. Blockchain powered solutions may be a worthwhile technology to respond to such cyber security concerns. Australia and Singapore have concluded a trial of issuing and verifying documentation for cross-border transactions across the two countries’ independent systems using blockchain technology.

The parties that recently introduced the eBL shared the following reasons that motivated the introduction:

- *innovation* - the eBL is creating a foundation for innovation in other areas.
- *customer journey* - it helps its digitisation.
- *operational efficiency* - shipments can be released faster and with less manual activities. The paperless BL eliminates administrative overheads and courier costs, and lowers the insurance costs as document loss risk drops close to zero.
- *documentation chain in trade* - it is made securer and swifter.
- *sustainability* - every eBL reduces the number of physical visits to front desks, which also provides a COVID-safe alternative to previous manual and in-person practices.
- *security* - the eBL solution contributes to improved security ensured by the adoption of contemporary technologies, such as peer-to-peer blockchain, encryption protocols and cloud-based technologies. The eBL reduces the risks of forgery and fraud.

Additional (direct and indirect) benefits that can be expected from the introduction of the eBill of Lading (as identified by the container lines) are faster business transactions, error reduction, reduced paper processing and manual labour, lower risks, easier access to documents, reduced number of actions that are needed to be performed for the overall supply chain operation, reduced operating costs, an easier and faster amendment process, reduced data entry / data entry errors, stronger relationships among stakeholders, faster responses and higher quality of service, improved customer support, and more effective system integration.

A particular barrier identified by some shipping companies is the lack of a legislative framework with a worldwide scope. Almost every jurisdiction has its own regulation. Local practices and laws as well as 'legal grey zones', namely, locations without clearly enacted laws that validate the use of electronic documentation pose challenges to adoption. As maritime transport is pursued in a global context the benefits can only be realised when all parties can legally accept the eBL and other electronic documents. Also, banks need to cooperate. Common practice is to demand paper documents for transactions based on a Letter of Credit. The necessary change in practice could be incentivised by the Banking Standards Association and the International Chamber of Commerce (ICC).

Also, the 'first-use-barrier' remains quite high. There are two main reasons: the lack of awareness of the solution and a perceived "all-or-nothing" limitation, in other words, the need for every party to “buy-in”, so as to avoid parallel processes and the costs that come with that.

¹⁰ https://www.marineinsight.com/maritime-law/what-is-bill-of-lading-in-shipping/#Electronic_Bill_of_Lading

Finally, communication and efficiency require interoperability which is hampered by the lack of standards. However, several regulatory bodies and law enablers are working on this, such as The International Group of Protection and Indemnity Clubs (IGP&I) that is covering liabilities regarding the carriage of cargo and approving solutions, BIMCO for the next generation of charter parties, and the Digital Container Shipping Association (DCSA) that has recently launched eBL standards¹¹ and is now working with its members to implement those standards.

The expectation of the pioneers is to see a steady move towards adoption and usage of the eBL, gradually removing the complexities of paper-handling activities. While the transformation has just started the feedback received by the carriers from customers and offices alike indicates that the adoption is now a matter of 'when', not 'if'.

Final words – Data brings visibility and automation

There are many advantages to the introduction of electronic documents such as the eBL, but there are also some major topics still to work on. Industry-wide buy-in and further standardisation is essential.

The introduction of electronic documents is not just a question of reducing administrative burden and costs. It is also about additional opportunities that will arise for decision-making and the synchronisation of processes across the maritime supply chain network. Bringing forward the necessary new standards to unleash the opportunities that digitalisation provides is critical and a key aspect of Maritime Informatics.¹²

Shipping lines are introducing electronic documents to access the benefits of digitalisation. The introduction of electronic documents is a major step forward; but electronic documents are still regarded as documents and de facto the same operational processes are maintained. For the future, full digitalisation will occur when the same information moves from e-documents to true data (see figure).



*Figure: Transforming by digitising physical documents as intermediate step towards data-centric systems
(Illustration: Sandra Haraldson, Research Institutes of Sweden (RISE))*

¹¹ <https://dcsa.org/standards/ebill-of-lading/>

¹² Lind M., Watson R.T., Lehmacher W. (2021) Key steps towards a high performing maritime industry, Container-News, 27/3-2021 (<https://container-news.com/key-steps-to-a-high-performance-maritime-industry/>)

The step towards electronic documents brings forward two thoughts. First, a call for action for everyone to participate in the effort is required; which is also about legislative frameworks. Second, industry-wide adoption will allow the maritime sector to advance towards exploring automation possibilities that will enable the refinement of, and new processes to, transactions.¹³

The next, and more advanced move from a document-driven to a fully data-driven approach will then allow the maritime industry to achieve large-scale digitalisation and increased asset productivity. Something that is now expected by many if not most stakeholders along the transportation and supply chain that are seeking to capture additional value from shipping such as enhanced automation, visibility and an improved customer experience.

Other industries have demonstrated that the success of leading e-commerce players is rooted in their data centric approach. Paper order forms, confirmation letters, invoices, delivery or receipt documents do not exist. The winners in the digital age are operating based on data and links to data on their platforms. By introducing electronic documents, the maritime sector is taking the first step towards a similar and more efficient digitalised future. The big question is - how long will it take?

About the authors

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¹³ <https://macgregorpartners.com/ebol-automation/>

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