Digitalisation of trade documents

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The paper problem

International trade still runs largely on paper. A single shipment may require dozens of documents, many of them originals that must be couriered between continents. The bill of lading is the most important of them: it acts as a receipt for the goods, as evidence of the contract of carriage and as a document of title whose transfer passes control of the goods. The third function made it difficult to digitalise. A document of title must exist in one original that only one holder can possess, a property that an ordinary electronic file cannot reproduce.

Paper also invites fraud. A forged bill of lading, a duplicated warehouse receipt or a fictitious invoice is hard to detect when banks see only scans or photocopies and cannot check with the issuer. The frauds of 2020 exploited exactly this weakness. Electronic records with a single controlling holder would make duplicate financing far harder, since a second bank could not obtain control of a record already pledged to the first. The ICC's Digital Standards Initiative, based in Singapore, estimates that the adoption of electronic bills of lading could save 6.5 billion dollars in documentation costs and unlock 30 to 40 billion dollars of trade growth.[1]

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Progress has been slow. The Initiative gives the current adoption rate of electronic bills of lading as 12.8 per cent, up from 5 per cent in 2024, citing the container carriers' association DCSA.[2] In February 2023 nine major container lines committed to issue half of their bills of lading electronically within five years and all of them by 2030.[3] Bulk commodity shipping, which matters most for Singapore's traders, is not covered by that commitment and moves at its own pace.

Part 2A of the Electronic Transactions Act

Singapore has a long record of legislating for electronic commerce. The Electronic Transactions Act of 1998 made it the first country in the world to implement the UNCITRAL Model Law on Electronic Commerce.[4] The original Act and its successor of 2010 excluded negotiable instruments and documents of title, so that bills of lading and bills of exchange still required paper.[5]

The amendment of 2021 removed this barrier. The Electronic Transactions (Amendment) Act 2021, Act 5 of 2021, came into force on 19 March 2021. It inserted a new Part 2A on electronic transferable records, comprising sections 16A to 16S, and added to the purposes of the Act the adoption of the UNCITRAL Model Law on Electronic Transferable Records, adopted by the Commission on 13 July 2017.[6] Part 2A rests on the principle of functional equivalence. An electronic record satisfies requirements of writing, signature and possession if it is managed by a reliable system that identifies it as the transferable record, renders it capable of being subject to control and preserves its integrity.

The structure of Part 2A follows the Model Law closely. Division 2 deals with functional equivalence, including the requirement for possession or transfer of possession in section 16I. Division 3 governs indorsement, amendment and the change of medium between paper and electronic form in sections 16K to 16N. Section 16O sets a general reliability standard, while section 16P provides that a foreign electronic transferable record shall not be denied legal effect merely because it was issued or used abroad. Division 6 allows regulations for the accreditation of providers of electronic transferable records management systems and gives the Controller powers of direction and investigation.[7]

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The first adopter of the Model Law was Bahrain, which legislated in 2018. Singapore followed in 2021, in the same year as the Abu Dhabi Global Market, Belize, Kiribati and Paraguay. The United Kingdom enacted legislation influenced by the Model Law in 2023, France in 2024 and China, for bills of lading only, in 2025.[8] The British legislation matters greatly for Singapore, because most bills of lading and trade finance documents used in Asian commodity trade are governed by English or Singapore law. With both legal systems now recognising electronic transferable records, the principal legal obstacle to electronic bills of lading in the region has largely disappeared.

TradeTrust and SGTraDex

The state also built technical infrastructure. The Infocomm Media Development Authority developed TradeTrust, a framework of standards and open-source software that allows trading partners to issue electronic documents, verify their origin and integrity and transfer title documents across different platforms. IMDA states that the network connects more than 42,000 companies in 27 countries. In August 2026 a China–Singapore end-to-end digital trade pilot used TradeTrust together with the Chinese platform AEOTradeChain to issue electronic negotiable documents, known as eNCD.[9] TradeTrust is designed for interoperability: private platforms can use it to recognise each other's documents.

The Singapore Trade Data Exchange, known as SGTraDex, approaches the problem from the side of data. Launched on 1 June 2022, it is a public-private partnership founded by IMDA, PSA, Trafigura, DBS, Jurong Port, OCBC, ONE, Advario, PIL, Standard Chartered and UOB.[10] It provides a common data highway through which shipping lines, terminals, traders and banks share information with the consent of its owner. Its use cases include the detection of trade finance fraud, green and sustainable trade finance and bunker optimisation.[11] The participation of a trading house, two terminal operators and the three local banks among its founders reflects the government's method of bringing the users of a system into its design.

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Blockchain consortia and their limits

The banks pursued their own projects in parallel. In the late 2010s several consortia promised to move letters of credit and trade documents onto distributed ledgers. ING and HSBC were members of Contour, a network that aimed to cut the processing of a letter of credit to 24 hours from as long as ten days.[12] Other consortia, among them we.trade and Marco Polo, pursued similar aims for open account trade.

Most of these ventures did not survive. We.trade closed in 2022, Marco Polo's operator became insolvent in 2023 and Contour announced its closure in the same year.[13] Their difficulties were mainly commercial. A closed network of banks is only useful when the shippers, carriers, inspectors and buyers of a transaction all join it, a condition that few transactions met. The experience explains the shift towards open standards and legal interoperability that TradeTrust and the Model Law represent.

The Trade Finance Registry

The most direct response to the frauds of 2020 is the Trade Finance Registry, launched by the Association of Banks in Singapore on 23 June 2023. It maintains a central record of trade finance transactions in Singapore. When participating banks register new transactions, the Registry notifies them in near real time when a new transaction duplicates one already financed by another bank. Only data on corporate customers are submitted, in hashed and encrypted form. Duplicates can therefore be matched without revealing one bank's customer information to another. MAS publicly supported the initiative, stating that "collective action is needed to effectively deal with the risk of duplicate trade financing".[14]

The Registry is owned by the banking association and operated by Banking Computer Services, a subsidiary of the NETS group, so that no participating bank controls the data. Banks query the Registry upon receiving a customer's application, for transactions above a threshold set by the industry. By February 2025 the duplicate financing check was supported by 40 banks and had processed more than 18,000 queries.[15]

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The second capability links the Registry with SGTraDex. Launched on 12 February 2025, the Bill of Lading Genuineness Check allows banks to verify bills of lading in real time against data supplied by carriers, through carrier data aggregators. Until then banks had checked bills of lading by calling or emailing the shipping lines. Portcast and Ocean Network Express were the first aggregator and carrier to join. About 70 per cent of the Registry's participating banks planned to use the check.[16]

The Registry has limits. It sees only transactions financed by participating banks in Singapore. A trader that pledges the same cargo to a bank in Singapore and to a bank in Hong Kong, Dubai or Geneva escapes detection. The association acknowledges that the Registry will become more effective when connected to similar systems in other jurisdictions.[17] Non-bank lenders also remain outside it.

Notes

1. ICC Digital Standards Initiative (dsi.iccwbo.org, accessed November 2026): DSI described as "a global initiative based in Singapore"; using eBLs could save US$6.5 billion in documentation costs; reduced trade frictions could unlock US$30–40 billion in global trade growth. ↩
2. ICC Digital Standards Initiative (dsi.iccwbo.org, accessed November 2026): current eBL adoption rate 12.8 per cent, up from 5 per cent in 2024 (source: DCSA). ↩
3. Wikipedia, "Bill of lading" (accessed November 2026): in February 2023 nine DCSA member carriers (MSC, Maersk, CMA CGM, Hapag-Lloyd, ONE, Evergreen, Yang Ming, HMM and ZIM) committed to issuing 50 per cent of original bills of lading electronically within five years and 100 per cent by 2030. ↩
4. Infocomm Media Development Authority, "Electronic Transactions Act and Regulations" (imda.gov.sg, accessed November 2026): the ETA (Cap. 88) was enacted in 1998; Singapore was "first in the world to implement the UNCITRAL Model Law on Electronic Commerce". ↩

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5. Electronic Transactions Act 2010, First Schedule as originally enacted, excluding negotiable instruments, documents of title, bills of exchange and bills of lading from the application of the Act; removal of these exclusions by the Electronic Transactions (Amendment) Act 2021. ↩

6. Electronic Transactions Act 2010 (2020 Rev Ed), Singapore Statutes Online, current version as at 6 November 2026: long title and section 3(*h*) on the adoption of the UNCITRAL Model Law on Electronic Transferable Records "adopted by the United Nations Commission on International Trade Law on 13 July 2017"; Part 2A "Electronic Transferable Records", sections 16A–16S; legislative timeline "19 Mar 2021 Amended by Act 5 of 2021". ↩

7. Electronic Transactions Act 2010 (2020 Rev Ed), table of contents of Part 2A: s. 16I "Requirement for possession or transfer of possession"; ss. 16K–16N (indorsement, amendment, change of medium); s. 16O "General reliability standard"; s. 16P "Non-discrimination of foreign electronic transferable records"; Division 6, ss. 16Q–16S, on accreditation of providers of electronic transferable records management systems. ↩

8. UNCITRAL, "Status: UNCITRAL Model Law on Electronic Transferable Records (2017)" (uncitral.un.org, accessed November 2026): Bahrain 2018; Belize, Kiribati, Paraguay and Singapore 2021; United Arab Emirates (Abu Dhabi Global Market) 2021; United Kingdom 2023 (legislation influenced by the Model Law); France 2024; China 2025 (influenced by the Model Law, only for bills of lading). ↩

9. TradeTrust (tradetrust.io, accessed November 2026), article of 17 August 2026, "China-Singapore End-to-End Digital Trade Pilot Successfully Implements eNCD Using AEOTradeChain and TradeTrust". TradeTrust (tradetrust.io, accessed November 2026), by IMDA: "a framework that standardises digital trade with enhanced security and legal certainty"; verification of documents and transfer of ownership of title documents across digital platforms; network of more than 42,000 companies in 27 countries. ↩

10. Association of Banks in Singapore and SGTraDex, joint media release, 12 February 2025, "About SGTraDex": launched on 1 June 2022; public-private

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partnership founded by IMDA, PSA, Trafigura, DBS, Jurong Port, OCBC, ONE, Advario, PIL, Standard Chartered and UOB. ↩

11. SGTraDex (sgtradex.com, accessed November 2026): created through the Alliance for Action on Supply Chain Digitalisation; use cases including trade finance fraud detection, green and sustainable trade finance and bunker optimisation. ↩

12. "After $9 billion credit hit, banks seek trade finance revamp", Bloomberg via AJOT, 9 July 2020: ING and HSBC members of the Contour blockchain network, which aimed to cut letter of credit processing time to 24 hours from as long as ten days. ↩

13. Closure of we.trade (2022), insolvency of the Marco Polo network operator (2023) and closure of Contour (2023), as reported in the trade finance press (GTR, Trade Finance Global). ↩

14. Association of Banks in Singapore, media release, 23 June 2023: only information on corporate customers provided; data "hashed into an encrypted format"; statement of Marcus Lim, Assistant Managing Director (Banking and Insurance), MAS: "Collective action is needed to effectively deal with the risk of duplicate trade financing". Association of Banks in Singapore, "ABS launches Trade Finance Registry to counter trade finance fraud", media release, 23 June 2023: industry utility maintaining "a centralised record of trade finance transactions in Singapore"; duplicate transactions "trigger notifications in near real-time for further action". ↩

15. Association of Banks in Singapore and SGTraDex, joint media release, 12 February 2025: the Duplicate Financing Check "is supported by 40 key trade financing banks with more than 18,000 queries to-date"; ABS, "Trade Finance Registry FAQs", 12 September 2023, on the transaction threshold and the query upon receipt of the customer's application. Association of Banks in Singapore, "Trade Finance Registry" (abs.org.sg, accessed November 2026): TFR owned by ABS; operator Banking Computer Services Private Limited, a subsidiary of NETS group; nearly 40 banks have joined; ABS, "Trade Finance

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Registry FAQs", 12 September 2023: the utility "will be operated by an independent party and not by any of the banks". ↩

16. Association of Banks in Singapore and SGTraDex, joint media release, "Trade Finance Registry and SGTraDex further strengthen trade finance risk mitigation with real-time Bill of Lading Genuineness Check", 12 February 2025: verification previously "a manual process that involves banks calling or sending emails"; Portcast and ONE as first data aggregator and ocean carrier; "around 70% of TFR participant banks are slated to use the BL Genuineness Check"; DBS and Standard Chartered as current SteerCo Chairs. ↩

17. Association of Banks in Singapore, "Trade Finance Registry" (accessed November 2026): the TFR will become more effective when connected to similar systems in other jurisdictions, enabling it to capture offshore transactions. ↩

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