

# The Use of Blockchain Technology in Saudi Logistics

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## Instant Insight

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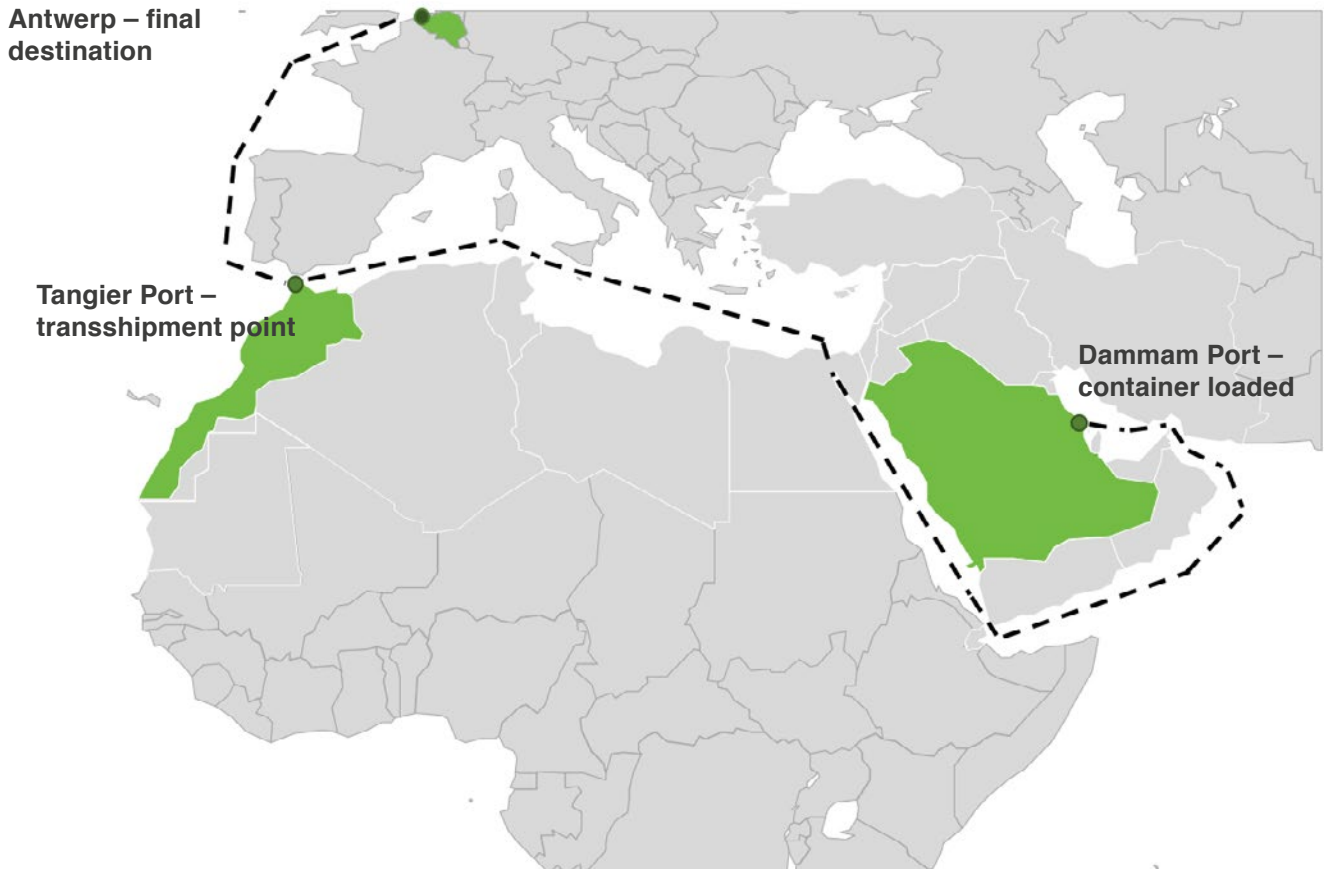
## Introduction

On September 21, 2019, Saudi Customs, the Ministry of Communications and Information Technology, the Saudi Ports Authority, and the logistics firm, A.P. Moller – Maersk, jointly announced the successful completion of a blockchain pilot project tracking a shipping container from King Abdulaziz Port, Dammam to the port of Rotterdam in the Netherlands (Saudi Gazette 2019). The project required coordination between the Saudi Customs and the respective port authorities of Dammam and Rotterdam, working through FASAH, the Saudi national customs tracking platform that connects all public and private stakeholders involved in cross-border trade, and TradeLens, a blockchain application created by A.P. Moller – Maersk and IBM based on the Hyperledger Fabric project of the Linux Foundation technology (Hyperledger Fabric, 2019).

A blockchain is a distributed ledger technology where information, typically holding some economic value, is recorded onto a database shared across a network of computers. The ledger uses a consensus mechanism to record transactions between parties with different interests in a way that eliminates the need for a central authority. It works by collecting groups of transactions into encrypted 'blocks' linked together as a tamper-proof public 'chain.'

One of the main innovations of this process is that it prevents instances of fraud and database errors or corruption. The ability to produce a reliable shared database in this way has been recognized as a major

**Figure 1.** Route taken by the pilot blockchain container.



Source: Saudi Customs.

innovation for the logistics industry. Maritime shipping typically uses physical paper documents to process transactions, leading to fraud, the loss of records and resultant delays. Blockchain applications can provide the shipping industry with a secure, transparent means to reform this process.

The blockchain pilot shipment began in Saudi Arabia on March 27, 2019, when the container entered King Abdulaziz Port. The consignor uploaded the documentation detailing the shipment to TradeLens using FASAH in a structured format. A structured format is key to ensuring standardization across the systems, which in turn helps with communication across the various systems. The export customs broker used this documentation to generate and submit the export declaration to Saudi Customs, who then used the same platform, FASAH, to register their clearance of the container (Public Relations 2019). Figure 1 shows the route taken by the blockchain pilot container.

After the customs clearance was received by the shipper, the container was shipped to the port of Tangier and from there to Rotterdam, reaching it on May 11, 2019. The Dutch customs authorities released information directly onto TradeLens using the Dutch Port Community System, Portbase, a digital service connecting smart Dutch ports. The container was then transported by truck to its final destination near Antwerp, Belgium (Public Relations 2019).

The TradeLens system enables blockchain-backed shipment documents to be analyzed and tracked. It handled and monitored all the stakeholder documentation in this transaction, from the departure of the container in Saudi Arabia to its arrival at its final destination in Belgium (Public Relations 2019).

## **Saudi Vision 2030 and the establishment of the Kingdom as a logistics hub**

The Kingdom aims to establish itself as a logistics hub, as outlined in Saudi Vision 2030, capitalizing on its location midway between the vast markets of Asia, Africa, and Europe. To achieve this aim, it needs to ensure that its processes and institutions can interconnect seamlessly with global trade systems. It has developed a detailed roadmap outlining how the country will streamline and reform its governance structures and regulations, enhance private sector participation and ensure that public-private partnerships help develop in-Kingdom logistics capabilities (Transport Ministry 2019).

To leverage its locational strength, the Kingdom is working on nine initiatives to help enhance its ranking in the World Bank's Logistics Performance Index metrics of international shipments, customs, logistics competence, timeliness, infrastructure, tracking and tracing (Transport Ministry 2019).

One of these initiatives is to help stakeholders enhance the security, transparency, and control of their imports and exports through electronic systems (Transport Ministry 2019). The development of the single window platform FASAH, a unified, integrated electronic data interchange portal, is a step in that direction. FASAH was the result of a collaborative initiative across many governmental entities (Tools&Solutions 2018) to automate cross-border trade processes and enable the increased transparency of shipments for the benefit of customs authorities (Saudi Gazette 2018).

## Technology as a freight enabler

Maritime transport constitutes the overwhelming majority of global freight (IBM 2019). Given the volumes traded and carried on marine transportation, trade documentation forms a critical part of the logistics chain. A single shipment may involve up to 30 actors, 100+ people, and 200 information exchanges (Mikkjelgaard-Jensen 2018). These information exchanges are either paper-based or electronic data interchange (EDI) systems working in silos isolated from one another, which often lead to problems such as missing documentation and fraud, among others, and potentially exposing stakeholders to shipment delays and related damages. Maersk and IBM's TradeLens helps solve these documentation issues. It increases visibility and transparency across the EDI systems, enabling problems to be identified and solutions implemented at a much faster pace, thereby producing efficiency gains.

There were some initial reservations as to why Maersk's competitors would join TradeLens and how much access Maersk would have to third-party data on the platform (Hill 2018). Some of those concerns were addressed with the use of Hyperledger Fabric, a permissioned blockchain technology. The source code for TradeLens is also shared with the platform's users. The data sharing specification, which defines who sees what data, is also available to all participants of the platform (Insureblocks 2019). For example, no two carriers can see each other's customer data. Though some concerns about the governance of TradeLens (which only includes IBM and Maersk) remain, so far close to 19 ocean carriers have joined the platform, along with many third-party logistics companies, government agencies, inland and intermodal services, and ports and terminals (TradeLens 2019).

The integration of FASAH with TradeLens is immensely helpful to stakeholders, as it helps to improve the security and transparency of import and export operations. Being able to track and trace shipments and generate a data trail ensures that EDI systems can respond to consignment queries in real-time, thereby reducing risk and increasing trust across the network (MEED 2019). This integration, initiated by Saudi Customs through its information technology partner, Tabadul, "ensures immutability, traceability, reduced reconciliation, auditability, and compliance and helps transform the maritime transport industry in the region and enable faster, transparent and safer operations." (Saudi Customs 2019).

## Developing blockchain solutions for the future

The TradeLens blockchain is currently growing rapidly, with several large shipping line and terminal partners. Another blockchain consortium, the Global Shipping Business Network (GSBN), was formed by container lines and terminal operators including ocean carriers CMA CGM, Cosco, Evergreen Marine, the Orient Overseas Container Line and Yang Ming, and terminal operators DP World, Hutchison Ports, PSA International and Shanghai International Port (Wass 2018). However, both the TradeLens and GSBN consortia have common members, which suggests that carriers are still exploring different blockchain technology options for resolving shippers' documentation issues.

The technology consultancy Accenture, Singapore-based shipping carrier American President Lines, freight forwarder Kuehne + Nagel and drinks manufacturer AB InBev have also initiated a blockchain shipping pilot (Allison 2019). It would be difficult to predict what a universally acceptable blockchain solution would look like

at the current nascent stage of the technology's development. However, a solution which offers the lowest barrier to entry and ensures that trust is instilled in the system would be universally accepted. Before this can happen, more countries need to start blockchain shipping pilots to see how the technology can benefit them.

Saudi Arabia has been an early adopter of the technology among the Gulf Cooperation Council countries, having successfully navigated the two pilot projects detailed in this insight. The greatest benefit of using distributed ledger technology like blockchain in commercial transactions is that it builds trust in the system, which in turn enhances the confidence of the stakeholders. Though the Saudi blockchain pilot shipment focused on an export container, the policy learnings which could be developed from this exercise would be immensely valuable in helping the region's transportation industries assess the benefits of the technology, potentially leading to the broader adoption of blockchain logistics solutions.

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