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IMPACT BRIEF

BLOCKCHAIN IN THE SUPPLY CHAIN - Driving End-To-End Change

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7 Data

This Impact Brief distills a wide range of reports and analysis on blockchain in the supply chain – exploring its benefits, challenges and future. **Brought to you through the objective lens of InsightBrief with the support of 7wData, the go-to destination for all things data.**

OVERVIEW

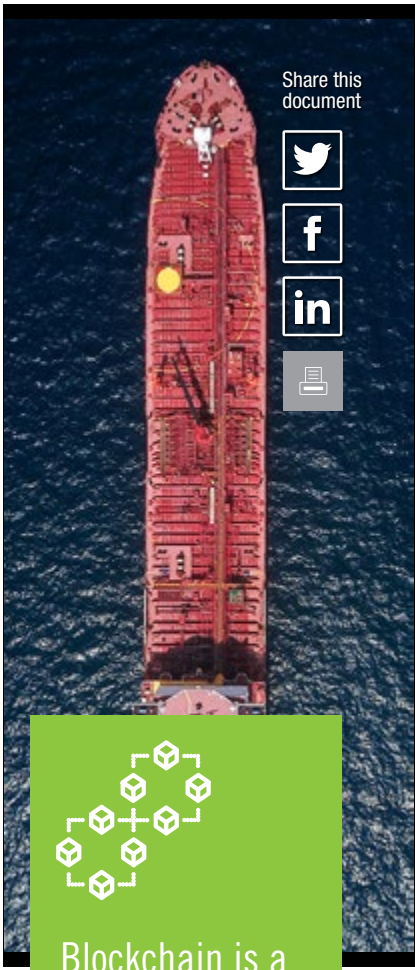
- Blockchain is a top 10 strategic technology trend in 2018 according to Gartner. By 2030, it is predicted it will provide $3.1tr of added value to businesses worldwide. [1,2]
- Blockchain can make tracking items and transactions in the supply chain radically faster and simpler when used in conjunction with IoT technology, cutting administrative and logistics timelines in shipping by an estimated 85%. [3]
- Where the movement of goods involves dozens of individuals and organizations communicating with each other, blockchain can dramatically simplify record keeping. For example, dispatching roses from Kenya to Holland reportedly creates a 25cm-high pile of paperwork – which would be obviated by this technology. [4]

BASICS

- Blockchain isn't a piece of software or an enterprise database. Instead, it is a distributed ledger technology, consisting of a shared record that is replicated across partner nodes – meaning that there is no central point of failure. Blocks, containing information, are then added to this record, forming a chain.
- Blockchain creates an immutable record. Once a block has been added to the blockchain, it is permanent and cannot be removed or edited. Multiple participants in the network must review the work of the others, making the record secure and reliable – and creating a shared source of truth.
- Distributed ledger technology is not necessarily public or open. Instead, in private networks, there may be many permissioned parties that can write to the ledger but only a select few that can read it.

BENEFITS

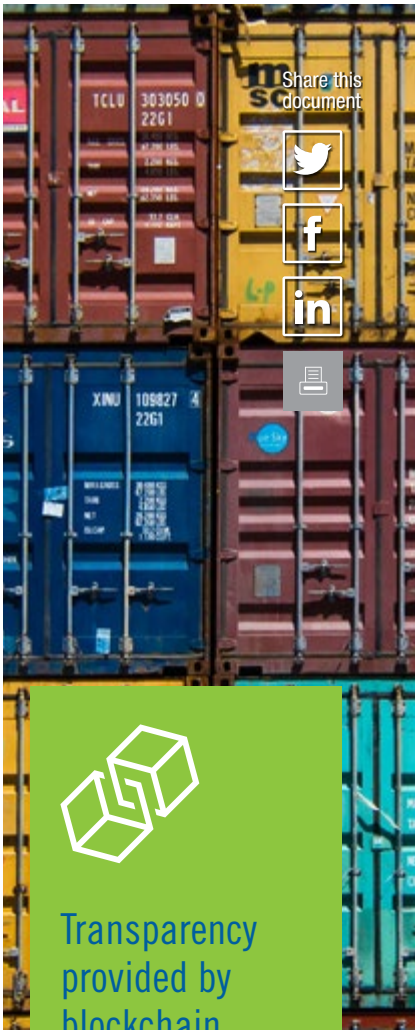
- Blockchain can add a great deal of value when combined with IoT devices, tracking real-world events and uploading the information to the chain. Applications include:
  - Automating payments on completion of delivery
  - Detecting temperature changes and voiding products that have been adversely affected
  - Recording security logs for items in transit



Blockchain is a top 10 strategic technology trend that will impact most organizations in 2018 according to Gartner.
By 2030, it is predicted it will provide $3.1tr of added value to businesses worldwide.

BENEFITS (cont.)

- Blockchain can help to authenticate items by tracking unique identification codes, either assigned to them or that describe their properties. For example, Everledger has a system that tracks 40 characteristics of diamonds, including color and clarity, in order to give them a unique diamond ID. [3]
- Blockchain technology enables real-time, multi-party tracking as well as providing a comprehensive, immutable audit trail, that can be extended to include the management of outsourced infrastructure.
- By automating monitoring and authorization, blockchain technology can dramatically simplify auditing and reconciliation in logistics, thereby saving time and eliminating errors and miscommunication.
- By reducing and simplifying auditing, blockchain systems can enable dramatic savings – which, on their own, may well cover a logistics organization's entire investment into the technology, according to EY. [5]
- Current electronic data systems can leave containers in receiving yards for weeks, awaiting sign-off. Continuous monitoring and automated data exchange via blockchain can make this process instant, accelerating the payment cycle and saving unnecessary storage costs. These developments will enable organizations to improve their liquidity and better manage risk.
- Continuous, end-to-end monitoring of the supply chain using blockchain technology reduces the risk of inferior and misidentified materials entering the system. This is critical in fields such as pharmaceuticals and high-end manufacturing, where counterfeit products can cost lives.
- Blockchain technology can provide enhanced visibility into the state of goods and delivery. This helps businesses better understand slowdowns and to identify where incidents of damage and theft are occurring.
- Transparency provided by blockchain technology strongly incentivizes good behavior. As there is a shared source of truth (via the distributed ledger), it is very difficult for organizations within the network to game the system or to commit fraud.
- By enhancing transparency, blockchain can help to certify organic, green and animal-free products, and to mitigate risks around:
  - Counterfeit goods
  - Food security
  - Conflict minerals
  - Child labor
  - Corruption
- By accelerating turnaround, increasing efficiency and making it easier to connect with partners via digital platforms, blockchain will lower barriers to entry across the supply chain – driving innovation and dynamism in the industry.
- Using blockchain technology does not necessarily need to be disruptive. EY suggests that if deployed effectively, this technology should slot into existing toolsets so that it is indistinguishable from the existing infrastructure. [5]



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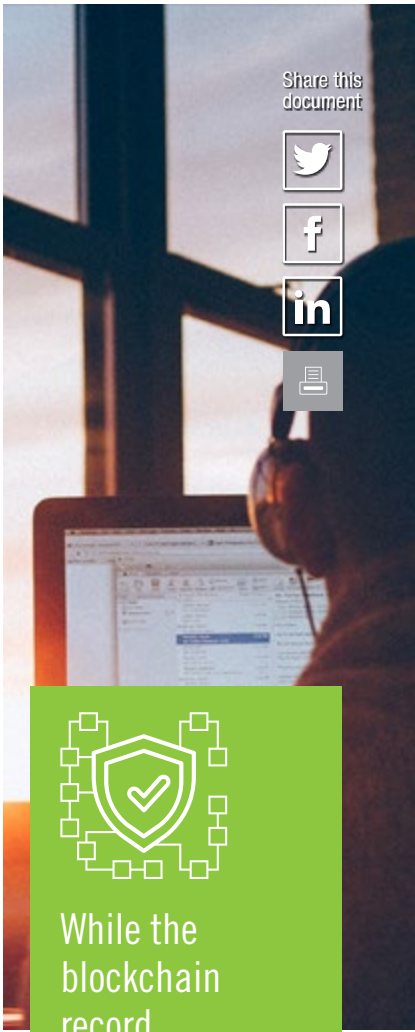
CHALLENGES

- For blockchain to be deployed successfully across the supply chain:
  - Joint standards (covering terminology, development, security and more) are essential
  - The technical ability to handle large transaction volumes must be enhanced
  - It needs to smoothly and easily interface with legacy systems
  - Broad stakeholder buy-in is required
- While the blockchain record possesses a high degree of integrity, organizations will need to ensure that they are vigilant to cyber-security threats given that entries on the ledger are distributed immediately and are then permanent.
- For blockchain to add value to the supply chain, it will generally require extensive use of IoT devices. In addition, every step of the supply chain must be digitized and integrated, presenting a logistical challenge at the launch phase.
- Many of the anxieties about using blockchain in logistics are unfounded. For example, concerns that sensitive information would be shared or that competitors might track transaction flow can be answered by the fact that data would only be accessible to permissioned key holders and that all information would be encrypted.

CASE STUDIES

- IBM and Maersk are launching an end-to-end supply chain trading platform that integrates blockchain, AI and IoT technology. It has already been piloted by DuPont, Dow Chemical, Tetra Pak and U.S. Customs and Border Protection. [6]
- Blockchain applications span the supply chain. For example, Everledger uses IBM's platform to track diamonds from mine to store, leaving stolen items and conflict-zone jewels outside the system. Meanwhile, IBM has partnered with Walmart to track lettuces, steaks and cakes. [4 7]
- Bext360 is a SaaS platform that combines blockchain, AI and machine vision and aims to bring new levels of traceability, transparency and sustainability to the supply chain. The company's original initiative was to launch the world's first blockchain-tracked coffee, with the platform connecting stakeholders from farmers through to consumers.
- Bext360 tracks goods (such as coffee, seafood, timber) at each step of the supply chain, uploading the record to the blockchain. This:
  - Ensures end-to-end transparency, engendering trust
  - Provides an indelible record of the crop's quality and origin
  - Helps farmers obtain better prices, based on the condition of their crops



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CASE STUDIES (cont.)

» The SAP Leonardo Blockchain provides end-to-end tracking solutions, including one for the agri-food sector, that combines:

- A complete overview of the supplier network
- Traceability of every element of the finished product
- Condition monitoring during transit
- Product verification
- Consumer personalization
- Apps to reward best farm practices

» By establishing the provenance of items, the SAP Leonardo Blockchain helps secure the pharmaceutical supply chain and prevent fraud. It also assists companies in complying with the Drug Supply Chain Security Act, which requires the identification and verification of sellable returns (representing 2-3% of sales or 58.7m units annually).

» Blockchain can centralize and dramatically reduce the amount of record-keeping needed for shipping. For example, the SAP Leonardo Blockchain can manage:

- Invoices
- Packing lists
- The bill of lading
- Export customs clearance and import declarations
- Driver pick-up instructions
- Identity checks
- Secure container release approval

OUTLOOK

» Blockchain initiatives are now moving from the proof-of-concept stage to full deployment. While companies must overcome technological and organizational hurdles for successful onboarding, suppy chain trading platforms incorporating blockchain – like those created by IBM and Maersk – have the potential to significantly lower barriers to adoption.

» Blockchain technology has the potential to significantly boost the global economy. By accelerating the flow of information in the supply chain, increasing efficiency and enabling the faster turnaround of goods, blockchain could drive trillions of dollars of trade over the next decade.

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