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Oil and gas, petchem industries trialing blockchain solutions

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The bulk of blockchain applications have been in the financial sector because the technology underpins cryptocurrencies. However, industry is awakening to the benefits that blockchain offers, including companies in the oil & gas (O&G) and petrochemical sectors. Adoption of blockchain technology across the O&G and petchem space may not be immediate or, at present, mainstream. However, the various types of solution being trialed highlight the growing interest and the technology's potential for disrupting the *status quo*, much like the internet did in its heyday.

A blockchain is a digitized, public, decentralized ledger; as blocks continue to grow, these are recorded and added to the ledger in chronological order. The decentralized ledger eliminates the need for intermediaries when it comes to paying for transactions thanks to smart contracts, with pre-programming to run once a given set of conditions are met on the blockchain. A third feature of the technology is tokenization, the process of protecting sensitive data by replacing it with an algorithmically generated number, or token.

"Financial services have a high level of adoption of blockchain technology, but beyond that, applications across other sectors are still in early-day trials. However, there are pockets of activity and most sectors are looking at it," says Jack Kent, associate director/ technology, media, and telecommunications at IHS Markit.

Simplified transaction processes

BP and Shell, in partnership with banks and trading firms, are already looking to develop a blockchain-based digital platform intended to modernize and transform post-transaction management of physical energy commodity trading, pending relevant regulatory approvals. Recently, Mercuria (Geneva, Switzerland), one of the trading firms involved, said a prototype of the platform has been tested using a real trade 'to validate expectations'. An oil cargo shipment was sold three times on its way to China and included traders, banks as well as an agent and an inspector, all performing their role in the transaction directly on the platform. The average total time for a bank to complete their role in the transaction went down to 25 minutes —from the usual three hours.

Petroteq Energy (Toronto, Ontario, Canada) and First Bitcoin Capital (Vancouver, British Columbia, Canada) also announced in November 2017 a partnership to develop and operate an enterprise-grade, blockchain-based platform that will enable O&G companies worldwide to carry out transactions. This application of the technology could disrupt the current processes for balloting partners on new projects, performing joint interest billing, and reporting production revenue, according to Petroteq.

"As a company focused on the development and implementation of proprietary technologies for the environmentally safe extraction of heavy oils, we understand the importance of developing new technologies, especially blockchain-based innovations, to help companies in our industry to get competitive advantage and cost-efficiency," Alex Blyumkin, CEO of Petroteq said at the time of the announcement.

The technology has the potential to simplify account reconciliation as well as track issues among the various parties involved, an advantage considering the volume of daily transactions carried out in the O&G sector. It also promises to streamline logistics, tracking costs, and inventory.

Faster concept to market, improved logistics

BASF is also exploring blockchain technology across different applications. The company, together with startup Kreatize (Berlin, Germany), is piloting a digital platform that facilitates the direct exchange between Original Equipment Manufacturer and supplier. Carmakers can upload CAD files of their automotive parts to the platform. A matching algorithm then presents them with the best possible material and production process, allowing them to order right away and pay directly online.

The pilot promises to improve concept-to-market time for manufacturers. However, nothing prevents BASF from mining a growing bank of data uploaded to gain insight on future consumer trends to become better at pre-empting consumer-driven material needs.

BASF is running a separate pilot together with two start-ups: Quantoz (Rotterdam, Netherlands) and Ahrma (Deventer, Netherlands). It is related to supply chains, allowing the recognition of incomplete or damaged deliveries applying blockchain and IIOT via sensors to create an "intelligent pallet," BASF says. The pallet can track position and movement of the delivery, and any missing or damaged parts can be re-ordered.

IBM and shipping company Maersk (Copenhagen, Denmark) have, meanwhile, launched a joint venture using blockchain, to streamline shipping by tracking the status of documents such as customs forms and bills of lading, to reduce the time it takes for shipments to clear inspections. Documentation and administration account for about one-fifth of the $1.8 trillion spent annually to move goods across borders. DowDuPont, Tetra Pak, the Port Houston, Rotterdam Port Community System Portbase, the Customs Administration of the Netherlands, and the US Customs and Border Protection have also piloted the platform.

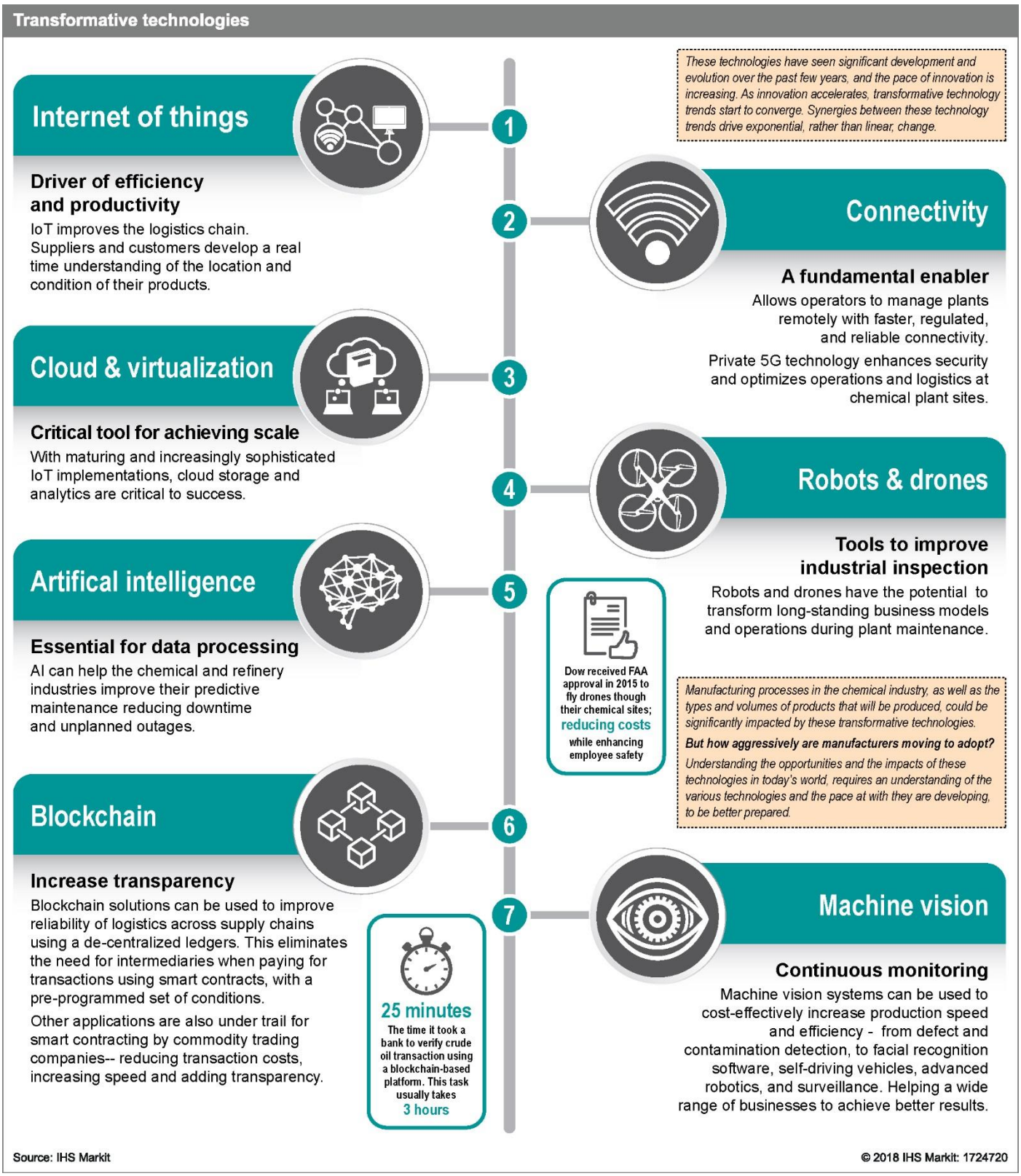
Fundraising and investor relations

ZrCoin, a commodity-backed blockchain option, raised $3.5 million through an initial coin offering (ICO). The ZrCoin "crowdsale" provides the funding for a new synthetic zirconium dioxide plant that uses a newly developed waste-based technology. ZrCoin says it is the first major globally traded blockchain security backed by an in-demand industrial material. From an administrative standpoint, blockchain allows for improved communication with investors, enhanced transparency, and voting options.

ICOs most likely could not fund major chemical projects valued at billions of dollars, but they may improve the potential of projects using new industrial manufacturing processes to raise the initial project finance required for pilot plants. This would create R&D opportunities for researchers or entrepreneurs. Opening up the fundraising through crowdfunding could also enable the public to decide which new processes generating greener material options they would like to use in their consumer products.

Another business angle is the impact that deployment of the technology is likely to have in the medium- to long term on workforce and workflows. Automation is bound to change the nature of the skills needed and disrupt the status quo. “The timeline for blockchain disruption and transformation of an industry will vary greatly, depending on industry readiness and as companies continue to experiment with the technology,” Kent says. “To this end, blockchain use-cases and business models must evolve significantly ahead of time before mainstream adoption can occur.”

Blockchain and other transformative technologies are making an impact in oil and gas, petchem



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