

Sign on the digital line

Blockchain technology could underpin a long overdue transition to smart contracts, finds John Kingston, but... there are a lot of buts

Before blockchain changes the world—as its most ebullient backers have forecast—it is going to need to score smaller victories. For the commodities industry, smart contracts will likely be one of the first places where the technology can provide changes that all agree are needed and which would advance current systems stuck in a time warp.

How hard has change been to come by? As one panelist noted on a fintech-themed panel at the fall 2017 PIRA Week conference in New York, the way that a market goes about all the steps needed to move a shipment of commodity A from seller B to buyer C hasn't changed in so long that it's doubtful anybody could tell you when it was significantly different.

There's been some progress. Paper documents now are scanned and sent via email. That's better than faxing. Or telexes, which were still used recently enough that

your correspondent is not too old to remember it—and even the turning off of telex machines at a strategic time of day by traders to avoid financial losses (it's a crazy story). But there's still a lot of paper, it's slow, and it's time consuming, and everybody wants it changed.

Enter, then, blockchain, and the smart contract hot on its heels. As a refresher course, blockchain is the technology that drives the bitcoin cryptocurrency, but the world is busily finding numerous ways in which its capabilities can be adopted to other markets:

financial settlements, digital advertising and music, shared storage... the list grows constantly.

Blockchain's sui generis classification is a distributed ledger. The key aspects of the blockchain ledger that could make it the basis for groundbreaking change in all of these markets are:

Shared: There is no central database in a distributed ledger application. The parties to the ledger—be it a public blockchain like bitcoin, or a private or permission ledger that would

presumably be the choice of commodity markets—all run the same software, and share all the data on the ledger (as opposed to all of it sitting on a central database). There is no single entity “in charge,” in the sense that there is a single point that can shut down commerce on the distributed ledger, which also means there is no single point of failure.

Consensus: The distributed and immutable nature of the data on the ledger provides “trust”—put in quote marks here because it is not the sort of trust that an individual earns from another by their actions. Rather, data on the ledger is trusted because its wide distribution provides an assurance that, for example, a party on the ledger does indeed own a particular

contract is not something that popped up just through the advent of blockchain; references to it date back to the '90s.

At its root, smart contracts are an “if/then” process driven by technology. The smart contract is designed to automatically produce a certain outcome—deliver ownership and physical possession of a commodity, for example—as certain inputs are met. For example, in a smart contract written to facilitate the movement of aluminum, an entire series of “if” occurrences would be sought to propel the contract toward its goal: “if” the benchmark price of the commodity is received; “if” the digital bill of lading is provided for the shipment; “if” the digital letter of credit is provided...“then” the transfer of the aluminum from seller to buyer is completed. Not only that, the seller would get paid.

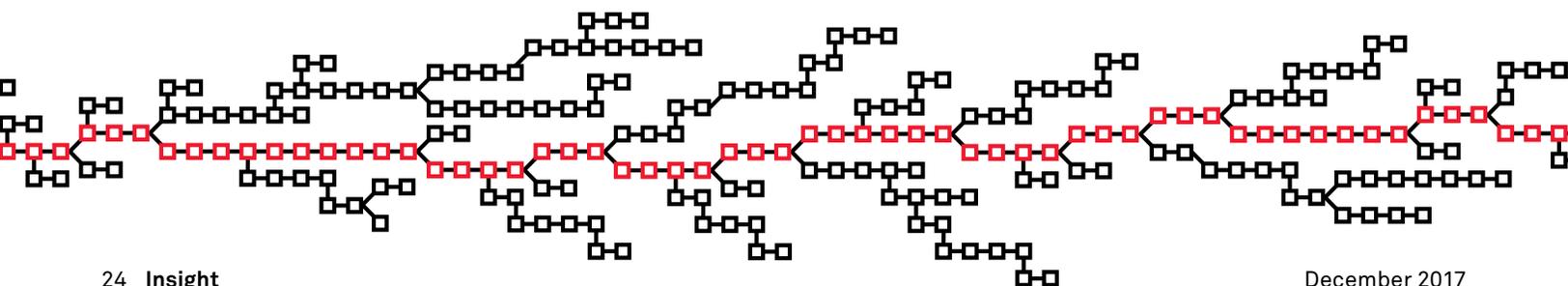
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Immutable: The shared nature of the ledger means that data on it cannot be altered. To do so would mean needing to change a data point on every stop on the ledger—known as nodes—a task that would take enormous time, computing power and run a high risk of the scheme being found out. (Contrast that with Equifax, where hackers only needed to invade one system to steal a gigantic pile of data).

diamond. (Diamond trade has long been based overwhelmingly on human trust, and was cited early in the blockchain era as a market that could benefit from the consensus—the “trust”—that a distributed ledger provides through its shared distribution of data, and its immutable nature.

With those characteristics in place, a smart contract can be developed. The idea of a smart

There would need to be a lot more “ifs” than the three mentioned. And there would need to be things like digital bills of lading, which traders bemoan now are still produced on paper, digital only if one considers a scan or a PDF to be digital. But “if” these things can be produced, and can become industry standards, “then” the industry can use smart contracts to move away from their current antiquated processes.



But and there are always “buts”—the idea of decentralization sounds good on paper, yet is not completely accurate. Bitcoin may be the ultimate decentralized distributed ledger but Satoshi Nakamoto—the developer of bitcoin, whoever he/she is, and however many humans actually make up him/her—still needed to make a choice that there would be 21 million bitcoins, and not one more. That’s just one example of a centralized decision.

A smart contract behind a ledger serving a market will need to have rules and standards, just like a current not-smart contract today. What are the rules around a bill of lading? Are there ports that carry special surcharges? What is the expected delivery window? The list goes on, and while it’s standardized now even in an analog contract, the slow, complicated nature of the deals means that humans can intervene and work around a problem.

A smart contract by definition would be far more efficient but wouldn’t have that safety valve. Which means that the terms and conditions by which a particular market operates needs to be built into the contract, and that means somebody needs to be a leader and a convener, to get a market to agree to the basic terms of the market and

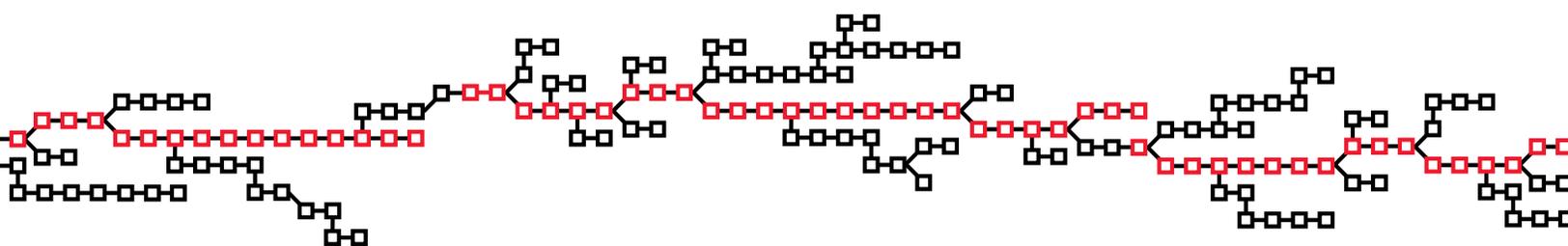
adapt current rules of engagement to the blockchain world. There is the question of who that leader would be, and who would provide the funding to develop the software for running the smart contract. (The entire new capital market of initial coin offerings developed largely to serve a need: getting funding to develop blockchain protocols when monetizing the open source blockchain software was going to provide difficult).

That is a question, but those pied pipers referred to earlier are starting to emerge. In early November, in what appears to be an expansion of an earlier blockchain-driven consortium, BP and Shell joined up with a consortium that already included trading powerhouse Mercuria and Dutch bank ING in what was loosely called a blockchain “trading platform” for energy commodity trading. A closer read of the formal press release put out by the consortium shows it to say that the goal of the effort will be to “develop a blockchain-based digital platform intended to modernize and transform post-transaction management of physical energy commodities trading.” Later on, the formal release says a goal will be “to manage physical energy transactions from trade entry to final settlement.” The assumption

in that sentence is that the trade being entered took place not on the ledger, but some other way, maybe even through an old-fashioned phone call. And once the trade was done, then the parties would turn to the blockchain being developed by the consortium to complete the antiquated systems used now for clearing and closing of deals.

The BP/Shell/Mercuria/ING/etc group is not the first. Earlier in 2017, Natixis, IBM and Trafigura teamed up in a consortium, specifically built on the Hyperledger Fabric platform, of which IBM is a key backer. In its announcement, it too noted that its tool would kick in “from the time a new trade is confirmed and validated, to when the crude oil is inspected, to its final delivery and cancellation of the letter of credit.” Again, nothing about actual trading, which everyone in the industry seems to agree is not ready to move to a distributed ledger system. You can hear theoretical discussions that a less-liquid market, always struggling with transparency, might find itself a candidate to trade on a distributed ledger. But the question then is what entity is going to risk the financial capital to develop one for markets where trade will always be light?

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But all of that trade—whether it is for a highly liquid commodity or one that moves infrequently—can benefit from the vast reduction of paper overhead inherent in the current system. The consortia mentioned here, as well as the others, don't specifically say "we're going to use smart contracts to get this done." But they're press releases, not instructional documents. Make no mistake about it: smart contracts will be the basis for the goal of cleaning up the current paper/email system.

(There are plenty of claims that there are blockchain-driven smart contracts operating today. Details tend to be scant, and it isn't clear how many are fully formed uses and how many are ongoing Proofs of Concept, to determine whether they are feasible. Still, earlier this year the ING/Mercuria joint venture, pre-BP and Shell joining, did successfully use distributed ledger technology to handle the movement of a cargo of crude out of Africa.)

So we're done, right? Far from it. One of the big questions that has been discussed in the blockchain ecosystem is whether a smart contract is legally enforceable in the way that a current paper contract might be. At a blockchain conference in Boston in November, Mickey North Rizza of conference

sponsor IDC, laid out the questions that have definitely not been answered. "Can a smart contract be written so that assets can be seized, or people can be taken to court?" she asked rhetorically, since those draconian actions are allowable under current contract law. She added that contracts are "used to enforce something." What if a smart contract is not enforceable?

At the Platts Digital Commodities Summit in mid-November in London, John Salmon, head of the blockchain practice at Hogans Lovell, opened his remarks by succinctly noting: "Smart contracts are neither smart, nor a contract." The reference to them not being smart is mostly the idea that they are nothing more than a computer program designed to make something happen, but will not pass the true legal test of being a legally enforceable contract. Still, he argued that they will provide a significant service to commerce in allowing "less ambiguity," and increasing standardization while helping to avoid fraud.

For lawyers trying to write smart contracts—regardless of their ultimate legal authority—they are going to need to hire staff members who can read code, or hire consultants for the same

task. Reading a piece of paper or Word document to determine the legality of an old-fashioned contract requires a law degree and the ability to read English. But for a smart contract, somebody is going to need to review the code that performs the "if/then" transactions to make sure not only they are doing what they're supposed to do, but also that the actions and requirements don't create new legal problems that need to be sorted out in some sort of arbitration.

Another question: things do happen. If a trade needs to be unwound for whatever reason, the current system, for all its flaws, does allow that to get done. But if transactions on the ledger are immutable, and nobody is in charge, can a legitimate mistake ever be rectified?

One can't help listen to the industry talk about the potential of distributed ledger technology without concluding that these and other questions will ultimately yield a solution. There's simply too much tied up—wasted?—in the processes that now begin after two traders say "Deal!" More speed means less capital tied up, and that means the potential for more market liquidity rises significantly. It's not an opportunity that is going to be missed. ■

