

Unbridled enthusiasm for distributed ledgers has given way to a more sober assessment of the technology's probable role in payments.

BY PETER LUCAS

A few years ago, evangelists for blockchain confidently predicted its widespread adoption to facilitate faster, more secure, and economical payment transactions.

The type of transaction didn't matter. Whether it was stock trades, the sale and transfer of real estate, purchasing concert tickets, real-time payments, or the grand prize of them all—credit and debit card transactions—some payment executives envisioned blockchain as a transformational technology.

What raised hopes is that blockchain allows money or assets to move directly between two trading partners, thereby eliminating the need for a central intermediary to oversee the transaction. In theory, that would drive up efficiency and drive down transaction cost.

Another caveat is that data within the blockchain provides an immutable, up-to-the-minute public record of any transaction at any point in time, making it impossible to double spend an asset. That knocks out the potential for fraud. Further, with a decentralized ledger, there is no central point of origin for transaction data. Multiple super nodes or miners continuously update transactions. This absence of a central point of origin makes it tougher for hackers to attack the data within blockchain.

But since then, payment industry executives have come to a sobering conclusion: Despite the technology's potential to

bolster the speed, security, and cost efficiency of processing payments, commercial use of blockchain remains in the distance.

'A FUNDAMENTAL PROBLEM'

The main stumbling block is blockchain's inability to scale to volume. Bitcoin, for which blockchain technology was created to serve as the public record of all the cryptocurrency's transactions, handles about seven transactions per second. By contrast, Visa Inc. says its network it can process 65,000 transactions per second.

The culprit lies in blockchain's architecture. Distributed ledgers require the consensus of multiple super nodes or miners that continuously update transactions on the blockchain to validate a transaction, a time-consuming process that limits network throughput.

"This is a fundamental problem with distributed ledgers that affects their ability to scale," says Nicko van Someren, chief security officer for Nanopay, a Toronto-based payment platform for real-time multicurrency payment solutions.

What the payments industry is discovering is that scalability issues are masked during trials because of the low volumes being tested. "But when attempts are made to scale volume, that's when issues arise," van Someren says.

Arlington, Va.-based Airlines Reporting Corp. (ARC), which annually settles more

than \$86 billion in transactions between airlines and travel agencies, learned that lesson the hard way during a blockchain trial.

"We wanted to learn what blockchain's potential was for use in transaction settlement internally," says Dickie Oliver, vice president and chief information officer for ARC. "After the trial, we feel it can't scale to manage the millions of records we handle each day, so we don't see it as a good fit at this time."

While ARC has decided against using blockchain internally for transaction processing, it is exploring its use to share data with customers. ARC recently completed a proof-of-concept trial with United Airlines Inc. to determine whether the technology can be used to facilitate reporting and settlement of United Airlines tickets with its settlement system (box, page 26).

Western Union is another player that has yet to see a business case for blockchain in mainstream payments. In mid-2018, Western Union chief executive Hikmet Ersek said that while the company began testing Ripple Labs Inc.'s xRapid network, which uses Ripple's XRP cryptocurrency, for payments six months earlier, the trial had yet to demonstrate a cost benefit.

San Francisco-based Ripple has promoted blockchain technology, which underlies xRapid and XRP, as a faster, cheaper way to move money.

Part of the problem with the trial, Ersek said, was that up to that point, Western

Union had seen just 10 transactions initiated with xRapid, too small a sample to determine its cost-effectiveness. Ripple has maintained that xRapid pilots have reduced user costs by 40% to 70%.

While Western Union was not planning to pull the plug on the trial prematurely, Ersek's remarks cast a cloud over the idea of blockchain for mainstream payments.

'THE NEXT STEP FORWARD'

Still, blockchain's struggles to move beyond the pilot stage have not completely cooled the payments industry's interest in it. Rather than force the technology into the high-volume, high-speed world of credit and debit card transactions, some advocates see a more practical use for the technology: high-dollar, low-volume transactions, such as money transfers and cross-border and business-to-business payments.

Besides having lower volume requirements, money transfers, cross-border and business-to-business payments can be run over private blockchain networks that operate outside the traditional rails of the banking system to provide real-time transactions and instantaneous reporting when a transaction is made.

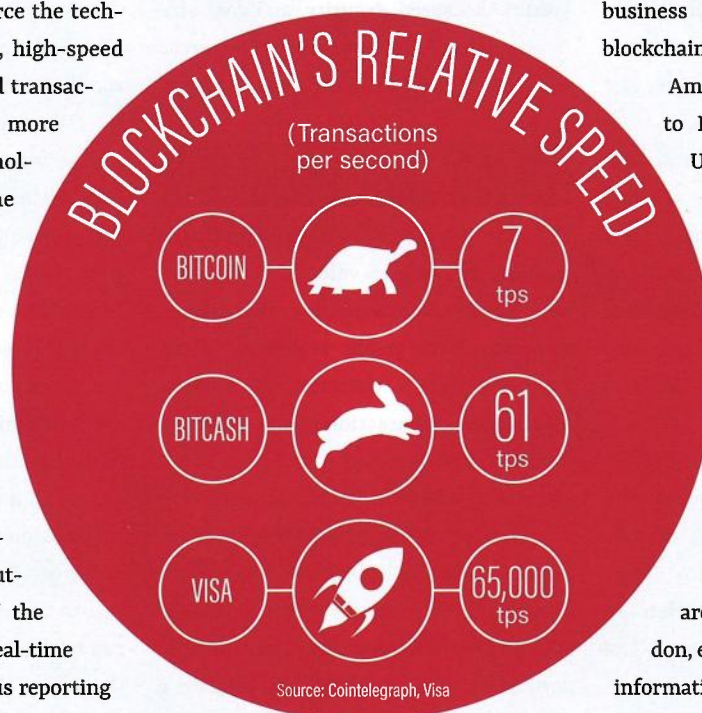
Those benefits are strong selling points. Operating outside the banking system allows money to be transferred immediately all day, every day. By comparison, it can take hours or days to move money from a payor's bank account to a payee's account through traditional banking channels.

If a transaction cannot be readied before the bank's close of business, for example, it will not be initiated until the next business day, which could be a day or more if the next calendar day is a bank holiday or the weekend.

Financial institutions joining such private networks can move money between

their customers' accounts any time, any day of the week. "Private blockchain networks provide an opportunity to initiate money transfers between known entities more cost efficiently and provide an immutable record of the transaction," says Sunil Hirani, founder of trueDigital, a New York City-based provider of a real-time digital-payment platform. "Our product is designed specifically for commercial users."

TrueDigital recently signed an agreement with Signature Bank, a New York City-based commercial bank, to transmit funds between other financial institutions over trueDigital's Signet platform. Hirani



says several banks have already joined the network, without being more specific, and that his company is in talks with more banks about joining and expanding the money-transfer service beyond U.S. dollars.

Third parties aren't the only ones pursuing private blockchains for payments and money transfers. Visa is preparing to launch during the first quarter of 2019 its B2B Connect platform, a private, permission-based, blockchain-based service built to process business-to-business payments globally, faster and more securely.

In addition to piloting blockchain-related capabilities in several areas of

its business, Visa has also dedicated a research team to explore how blockchain can be applied to its internal operations, clients, consumers, and partners.

"There are many possible use cases for blockchain and distributed-ledger technology, and we—along with many of our clients and partners—are looking at ways to harness its power," says Kevin Phalen, global head, business solutions at Visa.

Other card networks are jumping on the blockchain bandwagon, too. Since late 2017, American Express Co.'s FX International Payments division has been working with Ripple to enable business-to-business cross-border payments using blockchain technology.

AmEx customers are connected to London-based bank Santander UK, which facilitates the cross-border payments. AmEx says the use of blockchain speeds remittances from its customers in the United States to bank accounts in the United Kingdom.

"This collaboration with Ripple and Santander represents the next step forward on our blockchain journey, evolving the way we move money around the world," says Marc Gordon, executive vice president and chief information officer for AmEx.

Mastercard Inc., too, has launched a blockchain network for business-to-business and cross-border payments. While Mastercard provided no additional details about its use of, or future plans for, blockchain, the company did say it has been investing in blockchain, which includes filing patents, developing application programming interfaces, and making an investment in the Digital Currency Group, a New York-based venture-capital company focused on the cryptocurrency market.

"Blockchain has the potential to radically shift the way we exchange value," says a Mastercard spokesperson. "But to unlock

the benefits and full potential of blockchain, companies will need to collaborate, explore, experiment, and consider long-term implications.”

THE TWO-LAYER APPROACH

Despite the pivot toward private ledgers, some third parties in the payments

world are not giving up on migrating public blockchain ledgers to mainstream payments.

The Global Real-time Authorizations and Funds Transfers Project (GRAFT) is looking to develop a decentralized payment platform to facilitate commerce without central banks, payment card networks, or governments.

The decentralized network is open to participants fulfilling various functions, such as acting as super nodes to update the blockchain, and creating business and revenue opportunities for users.

Network users are given incentives to carry out automated payment network functions, including real-time authorizations, exchanges, fault-tolerant gateways,

WILL BLOCKCHAIN TAKE FLIGHT FOR UNITED AIRLINES?

Airline Reporting Corp.'s decision not to move forward with blockchain for internal transaction processing has not completely dissuaded the company from exploring whether the technology can improve ways to share smart contracts with its client airlines.

Last month, ARC announced it had completed a proof-of-concept trial with United Airlines Inc. to facilitate the reporting and settlement of United Airlines tickets. For the trial, ARC partnered with Blockskye, a Boston area-based provider of blockchain solutions to the travel-and-entertainment industry.

“One of the things we wanted to see is if we could create an ARC-owned blockchain to share data for smart contracts with United,” says Dickie Oliver, vice president and chief information officer for ARC. “With blockchain, all the parties involved in the contract can view the transaction and determine if there are any discrepancies before the contract is executed.”

Smart contracts are computerized transaction protocols that automatically execute the terms of a contract. Since the contract is recorded on the blockchain, its terms are visible to all parties named in the contract through the blockchain.

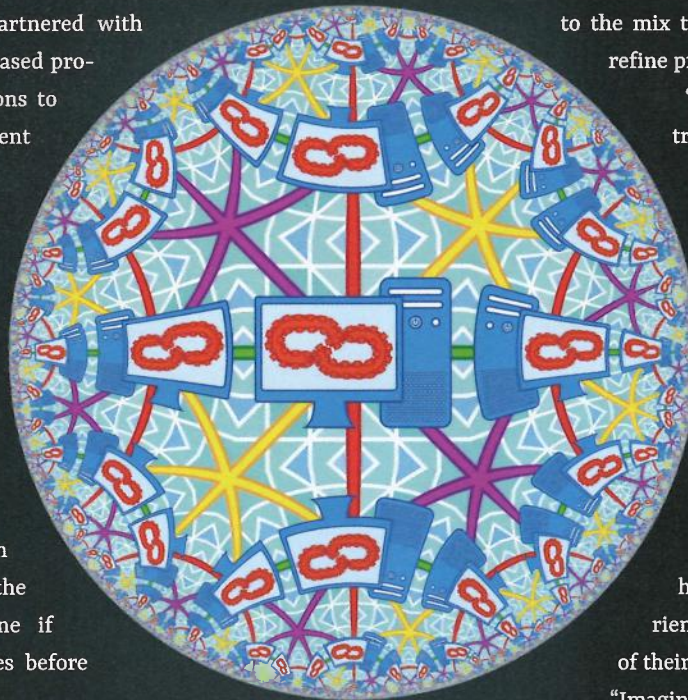
United opted to use blockchain to facilitate the reporting and settlement of tickets because it thinks the technology

can provide safe and reliable smart-contract transactions. “If it can help us make settlement safer, easier, and more seamless for our customers, then it’s a win-win,” says Tye Radcliffe, director of distribution for United.

The proof-of-concept trial demonstrated that transactions could flow between all of United’s and ARC’s various systems. The next steps will be to process actual ticket transactions, gradually add more travelers to the mix to determine scalability, and refine processes.

“The immutable and distributed nature of smart contracts, as well as the continued interest, research, and investment going into the technology, make it attractive for use in our own research and development,” Radcliffe says. “Proof-of-concept is a small step, and one of many in our efforts to enable our customers to have a truly seamless experience throughout every step of their travel.

“Imagine a world where your calendar could potentially become an indicator of intent to travel,” he continues. “[A world] where a traveler’s airport and onboard experience is simple and less stressful, and when the traveler returns to her office, her air expenses are automatically accounted for and settled. No itinerary receipts to submit; just a simple, blockchain-enabled settlement, powered by ARC.”



and merchant-service-provider services, according to the company.

"We see blockchain as a way to unteather consumers from traditional payment systems by providing strong privacy and control of transactions through a decentralized ledger," says Dan Itkis, co-creator of the GRAFT Project.

In other words, with no central point of origin for the transaction data entered into the blockchain, there is no single point hackers can attack.

"Consumers are tired of having their information hacked through merchants, processors, and the credit bureaus, which are all key [data] aggregation points," Itkis says. "Decentralization gives control back to consumers." GRAFT Project is preparing to launch its beta phase by the end of March.

Initially, GRAFT Project sees an opportunity to target underbanked and high-risk merchants, such as online gaming Web sites that can't get traditional merchant-payment services or pay exceptionally high acceptance fees and e-commerce merchants that sell adult content and Class A drugs. These merchants will be able to accept cryptocurrencies through the GRAFT Project platform.

To complete a retail transaction, which consumers expect will take two seconds or less, GRAFT has developed a two-tier network where the tiers operate separately, but in parallel. The first tier authorizes transactions in seconds. The second tier records settlement, which can take 24 hours or more, depending on the type of currency used to make the purchase.

As part of the authorization process on the network's first tier, multiple super nodes concur on the value, time, and date of the transaction, and validate that there is no double spend of the cryptocurrency being used.

Once the transaction is complete, authorization data is layered onto the blockchain of the network's second tier to provide a complete, up-to-the-minute accounting of the transaction. The settlement layer of the network supports payouts to merchants in multiple currencies. "Our goal is to guarantee speed of transaction, and our [two-layer] approach supports that," Itkis says.

GRAFT's approach to improving transaction speeds is similar to that of the Lightning project, an add-on for Bitcoin transactions that processes high volumes

the technology's applicability is through continued testing.

"Scalability is an issue, but it's incumbent on the payments industry to understand blockchain's capabilities for payments, what use cases make sense, and its value proposition," says Esther Pigg, senior vice president, product strategy, banking and payments, for Jacksonville, Fla.-based financial-service technology providers Fidelity National Information Services Inc. (FIS). "There is a lot unknown about blockchain and we shouldn't dismiss its use in payments yet."

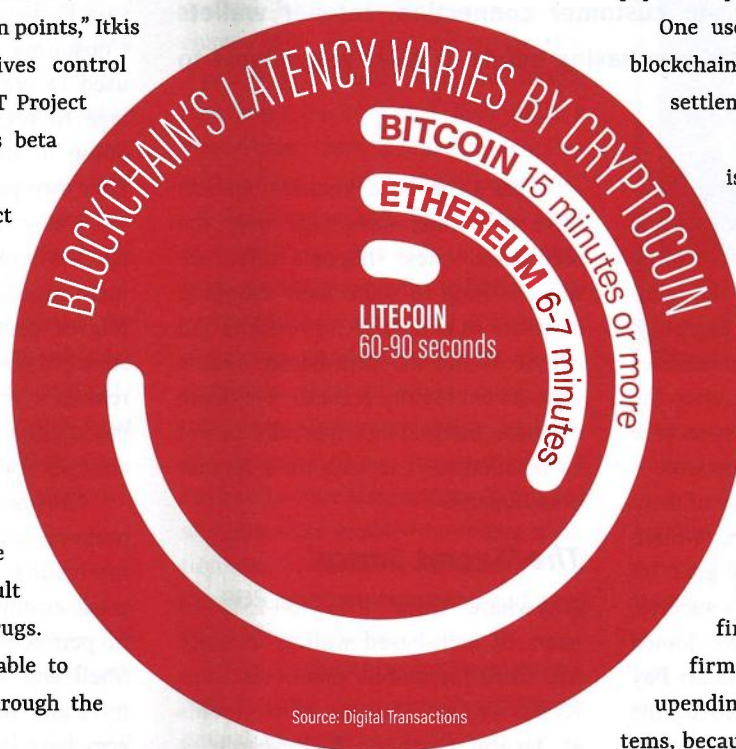
One use case FIS is looking at for blockchain is cross-border payments and settlement.

But for those who are bearish, blockchain remains a technology in search of a problem within the payments ecosystem.

"A lot of financial institutions and the card networks are dabbling in the technology, but there is nothing mission-critical," says Eric Grover, principal for Intrepid Ventures, a Minden, Nev.-based financial-services consulting firm. "I don't see blockchain upending the current payments systems, because it doesn't bring a compelling business case compared to what it is trying to displace."

Some skeptics think the best-case scenario for blockchain in payments is that elements of it, such as the immutable record of transactions, will be adopted and the rest left behind.

If that's what happens, it won't be the first time. "It's often the case with new technologies that only parts of it are useful for certain applications," says Nanopay's van Someren. "The peak of inflated expectations for blockchain has passed. It's time to demonstrate what, if any, productivity it has." **DT**



of small-dollar transactions by taking them temporarily outside the blockchain.

Ultimately, Itkis believes that the data entered on GRAFT Project's blockchain can be used for merchant-loyalty programs, and ultimately allow merchants to issue rewards to consumers through the network.

'NOTHING MISSION-CRITICAL'

If nothing else, supporters of blockchain for mainstream payments believe that the only way to prove or disprove