

Post-Bitcoin Technology Has Geeks, Giants, and Hackers Excited

“We’ve built an unstoppable, uncensorable world computer,” says one blockchain developer.

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Illustration by 731

In late February about 200 executives, coders, and developers gathered in the downtown Brooklyn office of JPMorgan Chase & Co. to hear an all-day pitch for a new industry group called the Enterprise Ethereum Alliance. Ethereum? It’s the ghostly sounding name for a so-called blockchain technology similar to the one that made the digital currency bitcoin possible. Its inventor, Vitalik Buterin, released his software to the world in 2015, not long after dropping out of the University of Waterloo, in Canada. Less than two years later, JPMorgan, BP, Microsoft, International Business Machines, and ING are among the companies in the group experimenting with it.

Buterin didn’t attend the EEA meeting, but he had a video message to deliver. Except the EEA couldn’t get the video to play, because the computer hosting it crashed. As the crowd began to stir, a frozen

frame of Buterin's face came on-screen, then he disappeared. After the tech crew scrambled for 30 minutes, they finally got it to work.

It's an apt metaphor for a technology that's come with enormous promises but suffered setbacks almost from its inception. Last year, hackers stole \$60 million worth of ether, the digital currency linked to Ethereum. The heist was a huge black eye—chances are, if you've heard about Ethereum, it's because of the hack. And yet it isn't dead. The reason: Unlike bitcoin, this blockchain isn't really about currency. Its advocates think it could be a universally accessible machine for running businesses.

"Ethereum gives you a new way for the computer to interact with the real world and how money moves," says Emin Gun Sirer, an associate professor of computer science at Cornell University. "It's potentially a huge game changer whose value has yet to be tapped."

Think of Ethereum as a way for people to make agreements and automate enforcement

To understand what the excitement is about, it helps to start with bitcoin, because without it, there would be no blockchain. Previous attempts to create digital money that could be sent as easily as email ran into a problem: How do you guarantee that each virtual dollar is unique, so the sender can't spend the same cash more than once? For bitcoin, this is solved with blockchain, which is simply an online ledger book that's distributed on computers around the world. It tracks and verifies every use of bitcoin. To give people an incentive to maintain the blockchain on their machine, it awards a number of new bitcoins to the first computer to verify a transaction. It's like a banking system that runs itself—but its main use is just letting people move currency from point A to point B.

Ethereum's ledger does more. It can store fully functioning computer

programs called smart contracts: If person A performs job B for company C, it will trigger a payment of D back to A ... and so on. As with bitcoin, the ether currency is a lure to get people to lend the system their computing power, and you need it to participate in a contract. Think of Ethereum itself as a way for people to make agreements and automate enforcement, all on a distributed network of computers. Once you can create contracts—which in essence are just operating procedures—you can use them to manage almost any kind of enterprise or organization.

For example, John Hancock Financial is experimenting with a tailored version of Ethereum to keep track of compliance with know-your-customer and anti-money-laundering regulations in its wealth management unit. Airline industry giant Airbus SE wants to know if its supply chain management can be shifted to a blockchain. Like David Hasselhoff, Ethereum is popular in Germany: Power producer RWE AG and online bank Fidor Bank are investigating ways to integrate it into their businesses.

The 2016 ether theft showed that though Ethereum may be powerful, it's still new and prone to mishaps. One of the first things people used ether for was to invest in a kind of decentralized venture capital fund built with an Ethereum smart contract. Investors could vote on how the fund's ether would be used; hackers found a bug in the contract that forced the fund to funnel its ether to them.

After much consternation, there was a vote in the Ethereum community, supported by Buterin, to edit the blockchain's transaction history so it appeared as if the hack had never occurred. Blockchain purists were so enraged at the idea of fiddling with the ledger, they began supporting an alternative form of Ethereum, which they took to calling Ethereum classic.

Buterin is unapologetic. "In general, the Ethereum community is on board with the notion that we do not have to do things exactly the way that things are done in other crypto communities," he says. "I did not create Ethereum to let hackers get away with \$60 million."

This is the stuff of passionate debates on Reddit forums, but it may

not matter to corporate users, because many of them don't want to work on the fully public Ethereum blockchain anyway. JPMorgan just released a version of Ethereum known as Quorum. Developers around the world can work with it, but only companies invited to participate will be able to record transactions and contracts on it. The Airbus blockchain would be similarly walled off.

These blockchains would run alongside the main version of Ethereum, which anyone can use. "We've built an unstoppable, uncensorable world computer," says Joe Lubin, founder of ConsenSys, a Brooklyn company that develops blockchain applications, speaking of Ethereum. Andrew Keys, head of global business development for the company, still sees the technology as a grass-roots tool for cutting out intermediaries of all kinds—from law firms to online social networks. "Our digital identity is on Facebook, and Mark's getting paid," he says, referring to Facebook Inc. co-founder Mark Zuckerberg. "Instead of them housing that, we'll have self-sovereign identity with peer-to-peer transactions." In other words, instead of using Facebook to control who can and can't see their family photos, people could one day set the rules themselves using smart contracts.

Ethereum is still a long way from that kind of success in either its public or private forms. The public version needs significant upgrades to be able to handle anything like the volume of interactions on the internet today. Ethereum's leaders, in their response to the hack, offended a substantial part of the blockchain development and programming community, which isn't that big. On the business side, corporations have to be convinced that they won't be giving away trade secrets through their use of a ledger shared with other companies. At the same time, they'll need to keep the technology open enough so that anyone can put their ideas into the same Ethereum ecosystem. "I don't want to build AOL," says Amber Baldet, blockchain program lead for JPMorgan. "I want to build the World Wide Web."

The bottom line: *Ethereum could present a whole new way to run a business, but there are some serious kinks to work out.*