

Chapter 13

New Business Applications for the Blockchain



Until recently, blockchain technology was primarily of interest to financial institutions. The ability of blockchain to authenticate digital information and create smart contracts is leveraging the usefulness of technology on a world-changing scale. The new breed of programmable blockchain platforms, such as Ethereum, which provides decentralized computational power, is making the technology applicable to a wide range of cases and industries.

Blockchain is commonly associated with the bitcoin cryptocurrency. The potential future environment for blockchain economy is a scenario in which cryptocurrency replaces current monetary systems on a global basis. This will have profound implications for the future exchange of value (Rouse 2018). Blockchain's digital democratization and its important feature as an unalterable and nearly impossible to hack digital ledgers is expected to foster emerging markets and economies as described below.

Decentralized Sharing Economy

Distributed ledgers enable peer-to-peer payments, opening the door to direct interactions between involved parties, and creating a truly decentralized sharing economy. For example, OpenBazaar uses blockchain technology to create a peer-to-peer eBay. Users can transact with OpenBazaar vendors without paying transaction fees (Bagley 2016).

Neighborhood Micro-Grids

This concept refers to neighbors who are empowered to produce, consume, and purchase power within their community. Blockchain technology enables the buying and selling of excess energy generated by solar panels using transactive energy platforms. LO3 Energy, a young New York company, is developing applications for a distributed energy supply system that draws on renewably generated sources for a more resilient, customer-driven economy. In 2016, the company enabled the small-scale trading of environmentally friendly electricity among neighbors who didn't have their own solar systems and those who produced excess solar electricity in Brooklyn, New York (Breuer 2017).

Data-Sharing Marketplace

Today, people are using social media platforms like Facebook to exchange their personal data for free. Historically, the users who generate the personal data have not been included in the selling and buying of that data. Blockchain technology enables people to manage and sell the data that their online activity generates. The key precondition for creation of a personal-data marketplace is user privacy. A blockchain network guarantees that there is always a smart contract between the data buyer and sellers that governs how consumers' personal information will be used. The companies Wibson and Opiria each announced the release of blockchain-based, decentralized personal-data marketplaces (Egorova 2018; Wibson 2018). Both marketplaces are supporting consumers' ability to securely sell validated personal information in a trusted environment. Individuals can connect to data sources such as Facebook, monitor offers from data buyers, and sell their personal data. Businesses can buy personal data directly from consumers using bitcoins or token, the internal currency used for rewards. Consumers receive payment for sharing access to their data when the transaction is confirmed. The founders of Opiria claimed that the global trading volume of personal data has reached \$250 billion (Egorova 2018). Finally, IOTA, the 10th largest cryptocurrency company, released its blockchain-based data marketplace. It is an open-source network designed to allow companies to sell or share unused data and to collaborate or inspire innovation within the industry (Williams 2018).

Machine to Machine Transactions

Machine to machine (M2M) refers to a technology that enables networked devices to remotely exchange information and perform actions without human assistance. Manufacturers use the real-time communication abilities of M2M to allow them to remotely track their supply chains and monitor warehouse operations from any

location. M2M communication is often used for warehouse management, traffic control, logistic services, supply chain management, fleet management, and telemedicine (Rouse 2010). M2M transactions is another emerging aspect of the blockchain technology where machines could use blockchains to become autonomous market participants with their own bank accounts (Rouse 2018). It is expected that advances in AI will enable machines to lease themselves out, pay for their own maintenance, purchase their own replacement parts, and keep their own transactional records using blockchain (Rouse 2018).

The French automaker, Renault, is piloting a digitized car maintenance program that uses blockchain technology to log all car repair and maintenance history in one place. The next stage of this pilot program is vehicle-based microtransactions—integrating the IoT with the exchange of value. Another example of blockchain application is blockchain-enabled tollbooths, introduced by Oaken Innovation Company for Tesla cars. The tollbooths and cars both have Ethereum nodes, which use smart contracts to trigger M2M transactions as the cars pass through the tollbooths (Groopman 2017).

Smart Cities

Smart cities are using information and communication technologies to increase operational efficiency, share information with citizens, and improve both the quality of services and citizen welfare. Blockchains are suitable for autonomous transactions between networked devices and machines. An electric car could pay a charging station for electric power or pay a toll for crossing a tollgate. The German utility company, RWE, is exploring the idea of blockchain-enabled smart charging stations. Bankymoon, a South African company, allows users of smart meters to pay for electricity with bitcoin (Velasco-Castillo 2016).

Digital Medicine

According to Wikipedia, digital medicine combines a prescription medication with an ingestible sensor component. After a user ingests the pill, the pill starts to transmit data to a patch, which is then stored on a person's smartphone in an app. Digital medicines are designed to communicate to mobile and/or web-based applications about what and when a patient has taken a specific dose of medication at a certain time and sends that information to other components of the digital system that can also show how a patient's body is responding (Chapman 2018). While there is only one "e-Pill" on the market right now, there is a good chance that all our medicine could perform these tasks in future. This will generate large amounts of medical data and will require a high-security place to store them. This is where blockchain will have its chance to shine.

An Open-Source World

Our economy relies on paper contracts and proof-of-identity cards for everything. These records are easy to lose track of, simple to manipulate, and not safe from professional hackers. Blockchain technology is a game changer. For the first time, we can create a permanent, safe record of every digital transaction, exchange of values, goods and services exactly as it occurs. This makes fraud, hacking, and information loss impossible. Blockchain has the potential to make life simpler and safer.

Value-Based Healthcare

The medical sector has been moving away from paper and toward digital applications for years. Blockchain technology has made record keeping more efficient and provides a solution to record-keeping problems in the healthcare industry. Blockchain is being considered for a system called value-based healthcare where patients pay for the value of care received rather than the medical processes themselves. Russia and Dubai are experimenting with the decentralized Robomed Network that uses smart contracts to allow patients to pay for the results of their treatments rather than the number of treatments received. As of last year, the Robomed Network had almost 9000 patients and 30,500 treatments performed (Williams 2018).

Energy Sector

For years, the energy sector has been moving from paper and toward digital applications. Blockchain technology can execute and record energy trades on a single ledger in a transparent and immutable platform. Blockchain is also a very efficient mechanism for conducting microtransactions. Microtransactions on the order of a few cents 100 times a day on a credit card would not be cost-effective. In Brooklyn, New York, there is an area where neighbors are buying and selling energy from each other in microtransactions using the blockchain as a platform—a few cents here and a few cents there (Shin 2016).

The technology also improves transparency and provides a means of more easily analyzing vast amount of data for compliance. Finally, blockchain enabled smart contracts are more legally binding and help reduce contract disputes for energy transactions. (Williams 2018).

Payroll Service

Blockchain can save major costs for companies that regularly pay wages to international workers or contractors. The main problems are speed to get funds to the contractor and the excessive exchange rate. Blockchain could be used as an application to compensate employees and pay wages in a timely manner and at minimum cost. Bitwage is the world's first bitcoin-based payroll service. The Bitwage platform receives wages from employers and then pays these wages to employees in each of their respective local currencies. The blockchain-based platform eliminates the costly fees associated with transferring money internationally for employers and employees alike, as well as the time it takes for funds to move from bank to bank (Rampton 2019). There are several businesses already using the service provided by Bitwage, including Wisconsin-based coffee company Colectivo and real-time Internet marketing company Rockerbox, based in New York.

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