Getting Involved in Blockchain

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Interest in blockchain technology has grown significantly over the last couple of years. A report from PricewaterhouseCoopers has named blockchain as a "tech breakthrough megatrend"[1] for CIOs, while Gartner has named it top of the "Hype Cycle"[2] for an emerging technology. So what actually makes blockchain one of the hottest topics today, and why is this technology receiving such a great deal of attention from lawyers? To understand this, let's look under its hood first.

What is blockchain all about?

The details of blockchain technology are very complex, involve mathematics and cryptography. At a very high level, the blockchain is a technology permitting an individual party to conduct and bill a transaction directly (on a peer-to-peer basis) with another party. The buyer and seller interact directly without any need for verification by a trusted third party intermediary (e.g. bank). Blockchain technology ensures the transparency and integrity of transactions purely through mathematics, and not trust.

Blockchain technology is best known for powering the Bitcoin digital currency. Yet, this cryptocurrency is not the sole application of blockchain. This type of technology may be applied to any transaction where traceability or visibility is required (e.g. proving origin of product, casting votes in an election, etc.). Today's blockchain application can be divided into three broad categories based on their stage of development, namely stages 1.0, 2.0, and 3.0.

The "Blockchain 1.0" category consists of virtual (crypto) currencies, such as Bitcoin, that can be used as an alternative to real currencies (e.g. euro or dollar). Despite the fact that more and more users are adopting the currency, with traded volumes on the rise, the absolute share of Bitcoin transactions on international foreign exchange markets is still minimal. At present, there is no indication that Bitcoin may ever come close to reaching the dimensions of other international currencies.[3]

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The next stage of development is smart contract models, which are collectively referred to as "Blockchain 2.0". "Smart contracts" do not refer to contracts in the legal sense. It is a digital protocol that enables the processing of transactions on the blockchain basis, rather than simply store information about them. This type of "contract" is already widely used across different industries. Escrow payment, digital rights management, marine shipping could serve as notable examples of smart contracting.

The next blockchain generation, referred to as "Blockchain 3.0", remains a vision for now. Blockchain 3.0 is the stage where the smart contract concept is developed further so as to create decentralized autonomous organizational units that rely on their own laws and operate with a high degree of autonomy.[4]

There is no doubt today that blockchain technology has the potential to radically change many industries as we know them now. Blockchain applications are generally considered to be a very promising technology. Yet, many decision makers, e.g. in the financial sector, are unsure how to respond to this trend: in a report conducted by PwC in 2016, 57% of respondents said so[5]. According to PwC, the lack of understanding of blockchain technology and its potential for disruption poses significant risks to existing business models and those firms that do not take the time to understand the impact. Business across industries should, therefore, be actively assessing how the digital ledger technology can help them to evolve and get to the next level of evolution. Let's look at some businesses and initiatives, which have recently been launched, that apply blockchain principle.

Big changes are coming

Finance

Finance is probably the sector which gave the blockchain technology the greatest amount of attention to date. For example, in May 2017 Nasdaq, Inc., Citi Treasury and Trade Solutions announced a new integrated payment solution that enables straight-through payment processing and automates reconciliation by using a distributed ledger to record and transmit payment instructions. This collaboration has created a pioneering institutional banking solution that

[1] https://www.pwc.com/jg/en/publications/pwc-global-fintech-report-17.3.17-final.pdf
[2] http://www.gartner.com/newsroom/id/3412017
[3] https://www.pwc.com/gx/en/industries/energy-utilities-mining/power-utilities/publications/opportunity-for-energy-producers.html
[4] https://www.pwc.com/gx/en/industries/energy-utilities-mining/power-utilities/publications/opportunity-for-energy-producers.html
[5] https://www.pwc.com/jg/en/publications/pwc-global-fintech-report-17.3.17-final.pdf

tightly integrates blockchain technology with Citi's global financial network leveraging API technology[6].

Moreover, Nasdaq is currently seeking to patent a system for securely distributing time-sensitive information via a blockchain. On 3 August the U.S. Patent and Trademark Office released the patent application entitled "Systems and Methods for Securing and Disseminating Time Sensitive Information Using a Blockchain". Overall, the document details how the system, by way of running on a distributed platform, enables information to be transmitted and timestamped, in a way that's reminiscent of bitcoin transactions on the blockchain. According to the application, the system would enable a user to submit a time-sensitive document to an authority, which, after making edits, could share it with a third party for approval. Each modification would be recorded and updated on a distributed ledger, in a bid to ensure transparency and prevent any alteration of that data. The system would also incorporate cryptography by giving each participant a public identifier and a corresponding private key.[7]

Numerous other exchanges and banks around the world, including the London Stock Exchange, Société Générale, UBS, UniCredit, HSBC, have formed the Post Trade Distributed Ledger Working Group (PTDL Group) to investigate how blockchain technology can be used to enhance clearing, settlement, and reporting of trades. According to almost half (48%) PTDL Group global members, blockchain will be adopted in the financial post-trade area in three to five years. Over a quarter (29%) of members believe blockchain will become adopted in as little as the next one to two years, though 21% forecast it will take in excess of five years.[8]

Government services and real estate

Governments have also shown interest in blockchain technology. Blockchain's features of decentralization and immutability have seen it Governments around the world show interest for a range of services, including real estate transactions.[9] Real estate transactions are usually time-consuming and bureaucratic. Because it is a trustworthy, decentralized system, blockchain can remove the need for middlemen, disrupt existing identity verification process (via digital IDs), reduce the risk of fraud (by creating incorruptible digital ownership certificates for each property), and track the regulatory compliance of a property.[10]

In April 2016, the software firm Bitfury Group and the Government of Georgia launched a project to register land titles via a private blockchain, which is a tamper-proof ledger, and then to make those transactions verifiable using bitcoin's blockchain, which is public. Having so far built the software and tested it with a couple dozen land title registrations, Bitfury and the Georgian National Agency of Public Registry have now signed a new memorandum of understanding to expand the service to purchases and sales of land titles, registration of new land titles, demolition of property, mortgages and rentals, as well as notary services.[11]

Yet, real estate is not the only Government service that has potential for blockchain. The Governments of Sweden, Estonia, Singapore, South Korea and the UK are exploring the use of blockchain for a variety of services ranging from banking and finance to healthcare.[12]

Earlier this year Ukraine also partnered with Bitfury Group. Ukraine's deal with Bitfury will begin with a pilot project to introduce blockchain into the country's digital platform. The areas being explored for the pilot project are state registers, public services, social security, public health, and energy. Once the pilot is completed, it is expected that the blockchain program will expand into all areas, including cyber security.[13]

Energy

International energy companies are also working on blockchain-based pilot projects. Earlier this year Shell, Statoil, Tepco, Centrica and half a dozen other energy companies joined the Energy Web Foundation, an alliance devoted to bringing blockchain to the grid. The foundation was set up as a collaboration between the Rocky Mountain Institute and Austrian blockchain developer Grid Singularity to accelerate the commercial deployment of blockchain technology in the energy sector.[14]

Al these applications are designed to interconnect prosumers (i.e. consumers that not only consume energy but also dispose of generation capacity in the form of solar systems, small-scale wind turbines or CHR plants) and/or provide a direct link between energy suppliers and energy consumers. Blockchain technology may, therefore, pave the way for future decentralization of energy systems.[15]

[6] http://www.nasdaq.com/article/nasdaq-and-citi-announce-pioneering-blockchain-and-global-banking-integration-cm792544
[7] https://www.coindesk.com/patent-reveals-nasdaq-planning-blockchain-powered-data-system/
[8] https://www.finextra.com/pressarticle/68000/post-trade-distributed-ledger-group-sees-bright-future-for-blockchain
Research carried out among PTDL Group global members across October and November 2016. In total, 45 individuals took part in the survey. They are senior executives within their organizations and are responsible for developing their blockchain strategies.

[9] https://www.coindesk.com/blockchain-perfect-government-services-heres-blueprint/
[10] https://techcrunch.com/2016/02/06/3-ways-that-blockchain-will-change-the-real-estate-market/
[11] https://www.forbes.com/sites/laurashin/2017/02/07/the-first-government-to-secure-land-titles-on-the-bitcoin-blockchain-expands-project/#3a73323a4dcd
[12] https://www.coindesk.com/blockchain-perfect-government-services-heres-blueprint/

[13] http://www.reuters.com/article/us-ukraine-bitfury-blockchain-idUSKBN17F0N2
[14] https://www.greentechmedia.com/articles/read/worlds-top-energy-companies-look-to-blockchain
[15] https://www.pwc.com/gx/en/industries/energy-utilities-mining/power-utilities/publications/opportunity-for-energy-producers.html

Other fields

Blockchain is showing a lot of promise. It is a wide-ranging innovation, so it is hard to predict now where blockchain technology will be used in the future. What can be said for sure is that there is no end to the types of its application. The other possible areas of application lie within identity validation, information storage, education, employment, intellectual property, insurance, accounting, etc.

Instead of a conclusion

So, with all that in mind, it is becoming apparent why blockchain is attracting the attention of lawyers. Blockchain's potential to create new business opportunities and revolutionize the way people transact are among these reasons. The other reason is the significant legal disruption that blockchain's application in different industries may give rise to.

Despite the significant opportunities for business, this technology raises many legal issues and pushes the boundaries of existing laws. Blockchain is currently not subject to specific laws or regulations. By definition, it is a decentralized technology and, therefore, has no specific location. In terms of jurisdiction and applicable law, territoriality constitutes a problem, as there are no ordinary "operators" or "hosts" that can be identified, as in the case with web-sites. This makes identifying legal responsibility difficult as there may be no party that is ultimately responsible for the functioning of distributed ledgers and the information contained therein. Moreover, servers for each blockchain network are decentralised and likely located throughout the world, which makes it almost impossible to accurately determine where a breach occurred. In addition to jurisdiction and responsibility concerns, many questions surrounding the security, privacy, data protection, intellectual property, and consumers' rights have still to be answered.

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Given recent developments, it can be assumed that 2017 will be a point of no return in the implementation of distributed ledger technology in practice. The fast growing technological expansion that it taking place today will definitely create a significant problem for the current legal framework which has to be modified to accommodate this rapid innovation.

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