

What if blockchain changed social values?

Blockchain technology could shake up many aspects of our daily lives, from the currency we use to the purchases we make. But what is the impact on our social values, and what can policy-makers do about it?

Blockchain technology is a remarkably transparent and decentralised way of recording lists of transactions. Their best-known use is for digital currencies such as Bitcoin, which has dominated the blockchain scene since 2013 with stories of booms, busts and black markets. With steady growth since 2015, however, Bitcoin is currently valued higher than ever before.

There are hundreds of blockchain-based currencies, and hundreds more blockchain-based solutions for tracking all kinds of transactions. They can be used for casting votes in elections, or proving that a document existed at a specific time, or to improve supply chain management, so that we know whether our diamonds are ethically sourced, whether our clothes were made



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in sweatshops, and whether our champagne comes from Champagne. They could help us to finally resolve the problem of music and video piracy, while enabling us to legitimately buy, sell, inherit and give away second-hand digital media such as books, vinyl and video tapes. They also present opportunities in all kinds of public services, such as health and welfare payments. At the frontier of blockchain development, self-executing contracts are paving the way for companies that run themselves without human intervention. All of these applications are discussed in a recent European Parliamentary Research Service study.

There are, however, some challenges to consider. For example, blockchain's transparency is fine for matters of public record such as land registries, but what about bank balances and other sensitive data? It is possible (albeit only sometimes and with difficulty), to identify the individuals involved in transactions, compromising their privacy and anonymity. It is also possible that future decryption technologies (quantum and beyond) may one day be developed and applied to information that, today, we encrypt and store on public blockchains. Some sensitive information simply should not be stored in distributed ledgers.

Potential impacts and developments

Transactions of any kind are usually faster and cheaper for the user when completed via a blockchain, and they also benefit from the protocol's security. Whereas transactions in Europe are often fast, cheap and secure enough for most purposes, users and proponents of blockchain applications often see additional benefits, perhaps in their transparency and immutability, or simply in the fact that they allow user transactions without recourse to traditional financial and governance institutions.

Some impacts are relatively direct. For example, it takes energy to run blockchains and, depending upon the size and the way it works, this can be quite intensive. It is often said that Bitcoin blockchain was responsible for electricity consumption comparable to that of Ireland in 2014, and has continued to grow. While more efficient algorithms and hardware can and are being developed, the energy intensity of blockchains (and, indeed, that of all digital processes) may become an increasing problem in the future. Another impact could be on 'white collar' employment. For example, some of the more routine work currently done by contract lawyers could be replaced by automated peer-to-peer transactions and smart contracts. Many commentators are relaxed about this prospect, drawing parallels with industrial automation to argue that blockchain development would leave more time for the core high-value tasks of providing bespoke services, while new high-quality jobs would be created in the design and maintenance of the necessary systems.

The most profound impact of blockchain development could be through its contribution to subtle changes in broad social values and structures. Just because technologies can be used for both 'good' and 'bad' actions, does not mean that they are neutral. On the contrary, all technologies have values and politics, usually representing the interests of their creators. In this light, the reasons why traditional ledger systems position their creators as the central intermediaries are clear: since all transactions pass through them, the creators maintain their position of power and capacity to profit from their users. Each time we use technologies, we reaffirm the values and politics that they represent. In this case, each time we use a distributed ledger we participate in a shift of power from central authorities to non-hierarchical and peer-to-peer structures. To say that blockchain's popularity is due to increasing social trends to prioritise transparency over anonymity, to diminishing trust in traditional financial and governance institutions, and to expect greater levels of accountability and responsibility in all aspects of our lives, is only part of the story. Nevertheless, using blockchains instead of traditional ledgers actually invokes these very shifts in society.

Of course, the governments and industry giants that are already investing heavily in blockchain research and development are not trying to make themselves obsolete. Not all blockchains carry the same social and political values of total decentralisation. While Bitcoin and many other well-known blockchain-based applications are 'non-permissioned', which means that that everybody has equal permission to use them, it is also possible to develop 'permissioned' blockchains, which maintain some centralised control by allowing an authority to determine who can participate in the blockchain in which ways. These blockchains embed a more moderate form of decentralisation than non-permissioned blockchains, and are attractive to institutions that wish to benefit from the possibilities of blockchain without ceding all control over their operation.

Anticipatory policy-making

Even if blockchain technology is not the solution for every problem, is not always as decentralised as we might think, and will probably not lead to a revolution, it does appear likely that it will live up to at least some of the hype and could have a substantial impact in many areas of our lives. We should therefore prepare for the challenges and opportunities it presents. At this stage, four broad categories of action that governance institutions could mobilise in response to the emergence of blockchain technology can be identified:

- One is to respond to 'the problems to which blockchain is a solution' without using blockchain at all. For example, if demand for blockchain is based upon a desire for more transparency, then citizens could be granted more access to government data and processes without using blockchain systems.
- A second is to actively encourage development and innovation of blockchain technology by granting legitimacy to their products. For example, under some conditions, transactions on blockchains could be given explicit legal recognition as records of executed transactions.
- A third is to do the reverse of this, discourage the advancement of blockchain technology by refusing to accept the legitimacy of blockchain-based transactions, for example by overruling and reversing the clauses in smart contracts.
- A fourth is to adopt permissioned blockchain sub-systems within existing systems and structures, effectively maintaining the role and power of those responsible as middleman by providing some of the basic functionality of blockchains, but without offering full decentralisation and transparency. This model is already observed in public sector use of blockchain technology, as explored by governments, but also in the private sector.

Variations and combinations of all four strategies, as well as others, are likely to be considered and applied to blockchain technology in different domains and jurisdictions over the next decade. For the moment there is little appetite for intervention at European level. Indeed, a recent European Parliament own-initiative report on virtual currencies acknowledged the increased risks, which will require enhanced regulatory capacity and adequate technical expertise, while calling for a proportionate EU regulatory approach in order not to hamper innovation at such an early stage.

This 'What if ...?' publication is a product of the Scientific Foresight Unit (STOA) of EPRS. More information on the unit's activities can be found at <http://www.europarl.europa.eu/stoa/> and <http://epthinktank.eu/author/stoablogger/>

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