

Blockchain technology for e-governance

Policy brief¹

Dzmitry Markusheuski, Natallia Rabava, Vitali Kukharchyk

Introduction

Simple, convenient and effective interaction between the government and the citizen has become a common expectation in the modern information society. Electronic government solutions - based on automation of decision making processes on a nation-wide scale - are serving to meet these expectations, while generating efficiencies in government and social communications for each member of the society.

Electronic government brings fundamental changes to the distributed governance system, and affects the entire range functions related to document management and processing.

Belarus has made visible progress towards establishing an electronic government infrastructure and services. These achievements have been enabled primarily by accelerated development of information and communication technologies (ICTs). However, citizens' participation in e-governance in Belarus is still below the average for Eastern Europe, which is largely the result of limited penetration of interactive functions and online services available from the official web-sites of government bodies and institutions.

Among the multiple technological solutions, varying in speed, and the degrees of reliability and data safety, several recent technological innovations stand out, based on radically new principles of compatibility and offering great promise for electronic government.

Blockchain technology

In essence, a blockchain is a transparent distributed data base that records details on all transactions performed by the system's participants. In the context of electronic government, this means a technology that stores data on the results of all interactions between citizens and government agencies.

Importantly, the data are interlinked, coded and stored by all members of the system, and are automatically updated to reflect the changes made. Users act as a collective notary that certifies the accuracy of the data in the system and guards against abuses and scheming attempts. Blockchain technology acts as a control on the egoistic motives that cause some people to engage in corrupt practices to the detriment of society and state sovereignty.

It also creates a powerful incentive to abide by the rules that apply to all participants equally, thus creating a spirit of collective responsibility.

¹ Full text available in Russian at: http://sympa-by.eu/sites/default/files/articles/blockchain_v_elektronnom_pravitelstve.pdf. For inquiries: dm@sympa-by.eu. See also other BIPART researches available at <http://sympa-by.eu/en/bipart/research>.

Technically, blockchain is a technology that facilitates agreement among the participants on virtually any matter without the involvement of an intermediary; it thus creates a foundation for decentralised governance, promotes consensus-based social contracts and maintains a fair balance of interest beneficial to society.

A registration system based on blockchain technology can enhance the safeguards normally offered by the traditional registries. The cost of transactions can be greatly reduced by eliminating the payment of state duties and intermediary fees, while the transactions themselves can become less time-consuming, and also more transparent and more secure.

The main characteristics of the blockchain technology:

1. It is autonomous. There is no central organisation or agency to administer the blockchain and hold the keys to correction of the data.
2. It operates continuously. Because the data from the system is simultaneously copied to thousand of computers, they will still be available even if 99% of the computers happen to go off-line, and will be updated automatically as soon as they are connected to the net. There is only one conceivable way to stop the system - by cutting power supply and the Internet on all computers throughout the world.
3. It is safe. The codes used in blockchain technology are open-source, and have never been compromised. The code supports cryptographic auditing, i.e. a mathematical test to determine if any changes had been made to the data.
4. The code supports development of new services, software and other products, is not the property of any particular agency or corporation, and is not protected by copyright.

Applications of blockchain technology

Blockchain technology has demonstrated its feasibility and relevance in e-commerce. Its use is now being extended to new areas, related to electronic government.

Blockchain technology is being introduced in many countries, for a variety of purposes, including: registration of movable and immovable assets, such as: intellectual property, wills, social protection, health care data, and pension systems. Tested blockchain solutions are available to conduct auctions, to promote transparency of the national and local budgets, to secure reliable vote counting in elections, to create crowdfunding platforms enabling investors to trace expenditures on their projects.

In Belarus, studies are under way to explore uses of blockchain technology in e-commerce and banking, the first sectors to note its transformative potential and the capacity to automate provision of financial services and reduce their costs.

Given the indeterminate legal status of virtual currencies in Belarus (neither legal nor illegal, no official status and unregulated circulation), the status of the blockchain technology, too, is subject to considerable uncertainty. Unlike monetary circulation, where the issue of currency is the sole prerogative of the state, blockchain is a technology available to the state, as well as the citizen.

By enabling conclusion of smart contracts, blockchain technology facilitates direct disbursement of microloans through a process that is effective and secure, and does not require the involvement of a traditional financial institution. This decentralised and autonomous procedure enables a greater level of financial and asset collaboration, in which blockchain technology may bring together: a group of investors, members of a transparent crowdsourcing platform, or users of an automatic facility for reporting to investors.

Blockchain technology has the capability to improve the operation of the property registry, which now contain records of over 7.4 million property objects and grows by an average of 100,000 new records of property transfers per month. These transactions often involve public notaries and real estate agents, and are validated only by the entry of the appropriate record in the registry conditional on the payment of a fee.

Already, a contract between a seller and a buyer may be registered on blockchain, reserving for the other relevant parties (the state, banks, notaries, etc.) an oversight and observer role. The technology enables entry of all transaction data in a distributed data base available to all participants. Notaries and registrars will act as data miners and retain the authority to certify the transaction after payment of a sum equivalent to the state duty. All of these processes may be easily automated.

Furthermore, given the great amount of state property in Belarus, the Government's privatisation plans, and the high risks of corruption on the process, blockchain technology can bring more transparency by enabling electronic auctions based on other countries' experiences.

Blockchain technology may also be utilised during elections and referenda, as a medium for electronic or home-based voting. Citizens will be able to cast their votes into a virtual box designated by the Central Election Commission for each candidate or referendum choice, and each transaction will be certified by the system, acting as a collective notary.

Conclusions

Commercial and non-profit use of the blockchain technology across the world has demonstrated its significant advantages over traditional arrangements. The technology appears to be the most appropriate in areas that require storage and processing of large amounts of protected data.

Effective exploration and experimentation with the technology in a variety of fields depends on a favourable legal environment.

It should also be remembered that the technology's main distinction is that it represents a distributed network with encrypted data and no main server that could be hacked or tampered with. Blockchain-based arrangements - automated auctions, smart contracts, and decentralised autonomous organisations, among others, represent serious steps towards greater decentralisation.

It would be quite difficult to imagine extensive use of blockchain technology in a centrally planned economy. It can be expected to become the most effective in a system that favours minimum government intervention in the economy, where the regulator merely sets and enforces the rules and acts as an arbiter in disputes.

Final remarks

In summary, the obvious effect of blockchain-based solutions and their integration in the system of electronic governance will be increased effectiveness of government, reduced cost of transactions and simpler, quicker, more effective, and consequently more convenient means of interaction between the government and the citizen.

In practice, performance of an administrative procedure amounts to making a record in an official registry of civil status, property rights, health, etc. In consequence, the blockchain technology can be viewed as a unique and a universal technology that helps streamline and automate nearly all administrative procedures while increasing the transparency and effectiveness of e-government.